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Tropical Life:

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A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. IX.—No. 1.]

JANUARY, 1913.

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"Coco-nuts, the Consols of the East."

FURTHER Press reviews and notices have been received, but want of space compels us to hold them over for a future occasion.

"Tropical Life's" Prize Essay on the Fermentation of Cacao.

MR. G. S. HUDSON'S AND DR. NICHOLL'S ESSAY.

IN answer to numerous enquiries from subscribers to the fund for the above prize, and other friends, as to when we intend publishing the above essay, we beg to state that soon after we received the essays back from Mr. J. H. de Bussy we sent the prize one out to the authors to be revised by them previous to publication. Mr. Hudson having done his part of the work, passed the MS. on to Dr. Nicholls, who was leaving for Europe. Dr. Nicholls called at our office on January 13th and left the entire MS., which has since been put up into type, and no time will be lost in completing and publishing the book.

A Happy and Prosperous New Year.

1913—AND TROPICAL DEVELOPMENTS.

IN wishing you all, readers, advertisers, and other friends and supporters, a Happy and Prosperous New Year, we hope, and believe, that one and all will have a busy time, especially those connected with estate management and the collection, preparation and export of the crops, or with the supplying of the machinery, spraying machines, and general estate supplies connected with the tropics. Both 1913 and 1914 will see a considerable expansion on all sides, and now that coco-nuts and oil-palms have made their *début*, and are taking their place as plantation industries with sugar, rubber, cacao, tea, &c., there is no saying to what extent the expansion may spread. All we hope is that the money, if subscribed by the public, will be wisely and honestly spent, and that the promoters of the companies here, and the exploiters of the tropics abroad, will learn a lesson from the mulls and scandals of the past, and deal more fairly both with the shareholders at home and the natives abroad. Modern society may not be perfect, but it demands certain limits, and any director doubting this has only to secure a copy (when published) of the report of the Putumayo Commission now sitting, and to study the remarks of the Chairman, Mr. C. H. Roberts, M.P., or of Mr. Joynson-Hicks and other members of the Commission, on the behaviour of some of those in charge of the Companies, and what it may lead them into. We were present when the remarks were made. Mr. Roberts

delivered his opinion on the possibility of fourteen years' penal servitude, with something of the tone of the Mikado in Sullivan's opera when discussing the punishment of boiling oil for Koko. We do not say this from a spirit of levity, but as the only comparison we can think of to give an idea of the grim character of that Commission, which some folks seem to imagine is only designed to whitewash those concerned, and not to decide who the guilty parties, if any, are on this side. Such cases have been extremely rare in the past, and we believe they will be still more so in the future, but we feel sure all will agree that, from a moral as well as from a financial point of view, tropical plantation and exploitation promotion this century have been equal to any other group of Company promotions, and will yield as good, if not better, dividends on the capital subscribed. We hope and believe they will tend to improve rather than to deteriorate.

Tropical Exhibitions for 1914.

WE would remind our readers that next year will see the First International Cotton, Fibre, Tropical Products and Allied Trades' Exhibition, which Mr. Staines Manders is organizing for June, 1914, when it will be opened to the public in conjunction with the International Congress of Tropical Agriculturists, of which Professor Wyndham Dunstan, C.M.G., F.R.S., &c., is the President. It will be remembered that just twelve months ago, *i.e.*, in our January number (1912) issue, we devoted our leading article to suggesting that this Congress, which was then advertised to take place this year, should be postponed and held simultaneously with the 1914 Exhibition. We are glad to see that Professor Dunstan has been able to fall in with the idea. We hope that all the centres will take part, both in the Exhibition as well as in the Congress. We shall be pleased to supply fuller particulars, or our readers will see them from time to time in our columns.

Those friends interested in coco-nut and other palms will remember that in the advertisement pages of our book on "Coco-nuts" Mr. Manders called special attention to his wish for this section to be fully represented, and that he was therefore arranging for a Palms and Palm-products section, to include palm-fruit, palm-oil, palm-kernels and their oil: also coco-nuts, fibre, &c., as well as other sections for sugar, alcohol, vinegar, fibres, brush bristles, hats, sago, &c., from the following: Oil-palm (*Elæis guineensis*), wild date (*Phoenix sylvestris*), palmyra (*Borassus nipa*), nipa (*nipa fruticans*), kittool (*Caryota ureus*), buri (*Corypha data*), sugar palm (*Saguerus saccharifera*), sago palm (*Metroxylon rumphii*), and others.

Our readers should remember that the fourth International Rubber Exhibition will be held at the same time, but in the adjoining building. Being in June, when representatives from both East and West will be present in London, such a triple event as two Exhibitions and a Congress devoted to tropical agricultural industries all taking place concurrently, is certain to draw exceptionally large crowds to itself.

Referring to our remarks in the July issue, expressing regret that our Dutch friends were arranging an important rubber exhibition at Batavia, Java, in April next, which would clash with Mr. Manders's show in London, to the

detriment of both, and to the disadvantage of possible visitors, we are now pleased to report that it has been arranged to postpone the Batavia Exhibition until the end of September, and our best thanks are due to those in Holland and Batavia for the trouble and inconvenience, and possibly expense, that they have put themselves to in order to meet the wishes of the majority. We feel sure, however, that nothing will benefit so much by the postponement as the Batavian Exhibition itself.

Drying by the Acre.—Part IV.

(Or Part VI, counting February and March (1912) as Parts I and II.)

THE "BLACKMAN" FAN SYSTEM.

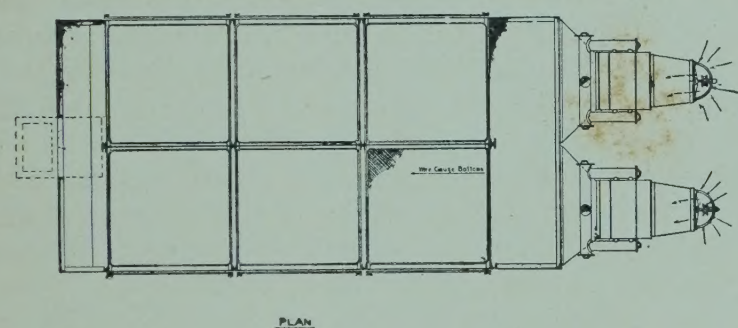
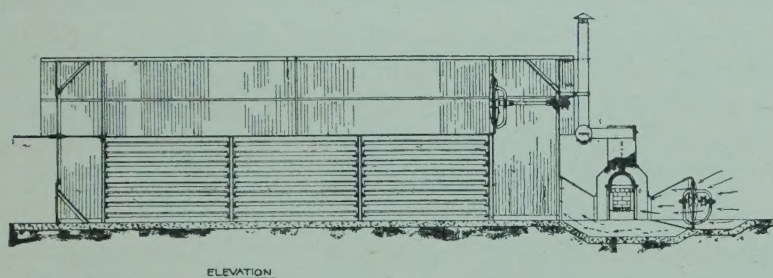
AS explained fully in our February and March issues, one of the chief ways of drying large quantities of tropical produce in the near future seems likely to be by spreading out the material to allow it to be dried by hot air, or otherwise by exposing it to the air (under cover) as much as possible, and withdrawing the moisture from it by means of hot air and fans. "We are pleased to note that the question of drying, on which we laid stress last year, has received much more attention, and excellent results have been obtained with most of the processes in use for quickly extracting the moisture from the freshly coagulated rubber. In view of the accommodation necessary to handle a large crop if naturally dried, this is a very important matter," so report Messrs. Gow, Wilson, and Stanton, Ltd., in their 1912 Annual Rubber Report. It will be remembered last year, as reported in our January (1912) issue, page 13, that this same firm said "Whereas . . . two months was no unusual time for drying, this operation can now be much better carried out in a few days with the use of crêpe machinery and a simple method of hot air and fan drying." As stated in our October number, the building we illustrated in February and March showed sufficient space between the shelving or floors for the men to walk about in an upright position. Whilst the principle then advanced appealed to all who read the article, either in our columns or when reproduced in other Journals, some complained of the building being much too high and costly, and asked us to show a plan and to give details, of a drying house in which shelves placed fairly close together took the place of the wide-apart floors. It is to satisfy such a request that we have continued these articles, and particularly the one this month.

On comparing the following illustration either with the one that appeared on page 34 in February, or page 44 in March, it will at once be seen that everything is practically the same, only instead of the layers of produce being feet apart, they are only so many inches, thereby reducing the total height of the building from 40 or 50 to only about 10 or 14 ft.; which gives about 6 ft. for height of trays. These shelves can also be drawn out on runners from one or both sides of the building, so that the copra can be sun-dried when the weather conditions are favourable.

By some the system of having the trays all on one side is considered to be the better, inasmuch as by its adoption the maximum use can be made of the sun and atmosphere for drying, so long as the humidity is not so great as to make the process too slow. Also should

the building be against a hill, as many are, the sun soon reaches the trays, and remains over them until it sets on the other side of the valley or slope. As it is quicker to push the trays in from one side than from both, having them all out one side has certainly many advantages, and we notice that in San Thomé, Samoa, and elsewhere, the trays all seem to come out one side, and often have permanent rails with concrete rests to support them, thus allowing four, six, or more trays to be pulled out in front of the others; and as you start pulling out the top row of trays first, so on the reverse you push back the bottom row first. With copra the trays could not be pulled out when rain or mist was about, but with coffee or cacao, a certain amount of drainage could be allowed for in the open before the trays were pushed into the buildings and the fans started.

The buildings as shown in the February and March issues were approximately 100 ft. long by 40 ft. high by 30 ft. wide, and were estimated to cost £500 for fans and



Drying on shelves by means of "Blackman" Fans and hot air.
Plan of Drying House.

heaters, and £1,500 for the building, whilst packing, freight, transport up country, and erection, would cost anything from £500 to £1,000, according to the distance and difficulties to be overcome.

The illustration given in this number shows a building in which the trays can be run out either side if desired, as previously mentioned. These buildings are made of galvanized sheet steel, and one measuring 40 ft. by 20 ft. by 12½ ft. will give a drying surface of 5,000 square feet. In this type of dryer the air is blown through the heaters into the drying chamber by two fans, and then over and under the trays on which the produce is spread. To obtain the maximum drying effect, the air can be further circulated by means of a large fan placed near the roof of the building.

The temperature of the incoming air can be regulated by means of the valve provided under the heaters, whereby a certain amount of cold air can be mixed with, and so temper the hot air entering the room, depending on the amount of opening. Further control is obtained by a second opening provided in the end of the rooms opposite to the fans.

The amount of warm circulating air can be varied within wide limits, and the direction of the air current

can be reversed if required. The trays are interchangeable, so that the material may be moved from one part of the dryer to another if desired, or taken elsewhere for the produce to "cool off" after drying, to prevent it forming mould on the voyage home. Such an installation can easily be erected and looked after by an intelligent person.

Of course we have had to curtail the description of this system of drying by shelves and fans, but anyone needing fuller particulars has only to communicate with the Blackman Export Company, Ltd., 70, Finsbury Pavement, London, E.C., who are past masters in the art of drying by hot air and fans.

Le Journal d'Agriculture Tropicale.

WE understand that changes are about to take place among the staff of our esteemed contemporary *Le Journal d'Agriculture Tropicale* of Paris. It will be remembered that after the death of M. Vilbouchevitch, the founder of the paper, M.M. Labroy, Baillaud, and Main took charge, with the first-named as editor-in-chief. M. Labroy, however, left to take up an official post in Rio, in connection with the Brazilian rubber industry, and has only recently returned. During these three or four years, M. Ferd. Main has practically had sole charge, but now M. Auguste Chevalier has come to his aid, having accepted the post of "Rédacteur-in-Chief," whilst M. Main becomes managing director. We feel certain that everyone interested in tropical development would have greatly missed this useful Journal, had it been allowed to drop out of existence on the death of its founder, and our best thanks, therefore, are due to M. Ferd. Main for the energy, ability, and resourcefulness he has shown in not only keeping the paper going (which he did in the belief that M. Labroy would be absent only a few months and not years), but in maintaining throughout the time that the paper has been under his charge the high standard set by M. Vilbouchevitch from its inception. We congratulate the *Rédaction* on securing the services of M. Aug. Chevalier, who has deservedly earned a world-wide reputation as an authority on tropical planting, and wish the new management every success for 1913 and the years to follow.

OUR thanks are due to the Atlas Preservative Co. for a 1913 copy of their useful Diary and Note Book, which we have always found as useful as it is compact and handy, which is saying a good deal. We have also received a 1913 copy of the popular Diary and Yearbook for the India-rubber and Allied Trades, issued by the *India-rubber Journal*, with its trade directory, and a host of lists of tables and pages of useful, in fact, indispensable, information for everyone interested in rubber. Which forces one to ask, Who is not interested in Rubber?

MOTTO FOR 1913.

Get out your Venesta cases. "We still hear complaints of rough cases being used," writes Messrs. Gow, Wilson in their 1912 "Annual Rubber Report." The insides of the packages must be well planed and smooth, so that the rubber shall arrive free from saw-dust, chips of wood, &c. Care must be taken to see that both cases and rubber are thoroughly dry before packing.

Planters at Pagani's.



Assistant Director of Agriculture, British Guiana, to proceed to Mauritius, to take up the directorship of the newly organised Department of Agriculture over there. These, the Editor of TROPICAL LIFE, and Mr. Cope made up the eight. Needless to say, with such a host and such a restaurant, a thoroughly enjoyable evening was spent. At the suggestion of Mr. Hayes those present drank "to the health of Mr. Stuart R. Cope" (not forgetting his rubber stumps, coffee robusta, and Soya beans) and wished him a "Merry Christmas and Prosperous New Year."

The Use of Cableways Extending.

THEIR ADVANTAGE ON COCO-NUT ESTATES.

REPORTS to hand from Latin America, India, &c., point to increased attention being given to the use of cableways for the transport both of passengers and goods. As our readers know, we have always been advocates for this means of transport being utilized in tropical districts, especially where a drop in the levels of the land enables the cost of running the cars to be reduced to a minimum. Where ground lines can be, or have been, laid, then, of course, it would be unwise to bring cableways into competition with them, but as subsidiary or branch lines to feed the trunk system the Telfer lines could be very useful in developing hilly districts, or those traversed by deep valleys, ravines, or rivers.

Brazil has already utilized cableways in this manner to advantage; for we see by the *Brazilian Review* that 577 people went up to Urca (on the way to the Sugar Loaf rock in Rio Harbour) by the cableway on Sunday, October 27th, and that when the aerial railway runs up to the summit of the Paô de Assucar, or "God's Finger," as the Sugar Loaf is also named, the number of passengers using it, in a day, will probably be more than twice that number, i.e., will exceed 1,200 persons. This shows what can be done by such a method of transport even under the difficulties offered by the picturesque but inaccessible land-locked harbour of Rio Bay, the magnificent views around which would evoke expressions of admiration from the most phlegmatic of mortals. Hence the anxiety of the authorities to enable the residents, and, perhaps most of all visitors and tourists, to ascend the Sugar Loaf rock to enjoy the view. About the middle of October the Brazilian President was among those who went as far as Urca, and it was his visit that caused us to hear of the intention of extending the cableway or aerial railway to the summit of the Sugar Loaf.

The *Indian Trade Journal* for some time past has included paragraphs about the agitation that is rife in certain quarters of our Eastern Empire, particularly among the members of the Upper India Chamber of Commerce, to induce the Government to grant concessions for, and to exercise adequate control over, aerial transport (we take it both for passengers as well as goods) throughout certain areas where it is needed. The Bengal Chamber of Commerce, after looking into the matter, have expressed approval of the scheme, so probably we shall soon see that India is following Brazil's lead, and where it is not convenient to transport people and goods along the ground, they will take them through the air. Thus as we had first

MENU.

Hors d'Oeuvres Riche

Bisque d'Homard

Petite Marmite

Filets de Sole Pagani

Tournedos Rossini

Haricots Verts

Pommes Rissolées

Roast Turkey

Salade

Xmas Pudding

Poire Melba

Dessert

Café Robusta

Stuart R. Cope's
Dinner to

Geo. S. Hayes.

Mrs. Hayes.

F. A. Stockdale.

Mrs. Stockdale.

Mrs. Harrison.

Miss Harrison.

H. Hamel Smith.

Pagani's

16th December 1912.

SURROUNDED by the autographs of the Stars of International Bohemia on the walls around them, names that included Melba, Maeterlinck and Clara Butt, Caruso, Tetrizzini, and Paderewski, Alma-Tadema, Burne-Jones, and Sir Ernest Shackleton, to say nothing of Pelissier and an innumerable host of others of equal fame, "we eight," whose names appear on the above menu, sat down to dinner at Mr. Stuart R. Cope's invitation on December 16th, at Pagani's, in Great Portland Street, which is quite close to the publishing offices of TROPICAL LIFE. The occasion was a "send-off" dinner given by Mr. Cope in honour of Mr. and Mrs. Hayes (who were leaving on December 18th for British Guiana, where Mr. Hayes represents some leading Americans who are planting Hevea rubber out there, and have, we believe, a very promising estate in the making); Mrs. and Miss Harrison, the wife and daughter of Professor Harrison, C.M.G., &c., Director of Agriculture in British Guiana; and Mr. and Mrs. F. A. Stockdale. Mr. Stockdale, it will be remembered, has relinquished his berth of

pedestrians, then trains, motors, and flying machines, so in transport we have also apparently come to the air to get along more quickly and economically. According to the press reports, the Bengal Chamber of Commerce, like ourselves, are opposed to laying down lines in opposition to existing systems of ground railways, but otherwise they consider that transport concessions would be of advantage in those parts of the country where tramways, light railways, or lines other than aerial cableways, cannot be profitably worked. We hope others of our Colonies will follow the lead of India and Brazil, for there are hundreds and thousands of miles of good lands that could be worked at a profit if some sort of transport was laid down, and if no other kind be forthcoming let the Colonial Governments also grant concessions for aerial railways, as leading men of business in India are agitating for.

This is not the first time, by any means, that we have called attention to the advantages cableways offer, especially for estate transport. We base our reasons for doing so on account of the following systems with which we are intimately acquainted as to cost, &c., and which have been acknowledged as pronounced successes ever since they were first laid down:—

(1) Lyme Regis Cement Co., Ltd., Lyme Regis, Dorset.

(2) Leeds Sand and Gravel Co., Ltd., Stourton, Leeds.

(3) Hinton and Sons, Madeira.

(4) Rhodesia Mining and Exploration Co., Rhodesia, S.A.

(5) Tharsis Copper Co., Ltd., Huelva, Spain.

(6) J. Scarlett, Water Valley, Albany, Jamaica.

(7) British Admiralty, Simon's Bay, S. Africa (passing six lines).

(8) Emborough Stone Co., Ltd., Emborough, Somerset.

Again, where we believe telpherage can be utilized to great advantage, is on coco-nut estates. Even if the trollies up and down the trunk line be hauled by petrol or steam locomotives, since the cars, or skips, when full would still be comparatively light, they could be hauled by hand or mechanically along the cableways, then lowered on to the trollies resting on the trunk line, and the empty skip lifted up and taken down the side cable to be refilled. With a double set of cables this could go on, as fast as the men (women, or even children) could haul them in or out. Meanwhile the loco, having deposited the empty skips, could go back to the factory with its train-load of full ones, without having even to unhitch or shunt the trollies, as they

remain coupled together right through, it only being the top part, *i.e.*, the skips, that are removed.*

Going back to the coco-nuts, the skips, or framed (iron or wood) trolley-tops, like the pitch-skips, could be made to take a recognized, average load, say fifty or seventy-five nuts in husk (that is to say 225 lb. to 350 lb. to a load, since the nuts in husk seem to vary in weight from 2.285 kilos to 2.368 kilos each, see page 414 of our book on coco-nuts), so that when they enter the factory, counting the nuts themselves would be dispensed with, and much time and money saved, since keeping a count of the skips would be sufficient to know the number of nuts sent in to be treated.

Again, as regards the matter of production and keeping count of individual sections of the estate, as well as of the plantation as a whole, if every skip was plainly numbered on both ends, it could always be returned to the same "piece" or section, and all the nuts from that particular area could then be calculated and watched. The management by this means

could then see if all sections were progressing equally or not, or if not, why not? Should unripe or otherwise unsatisfactory nuts be sent into the factory, those in charge could soon "drop on" the culprit and tell him to pick only fully ripe nuts. Were beetles or other pests to be noted, again the inspectors could at once proceed to the spot, and by examining the trees immediately, eradicate what would soon become a serious nuisance before any real harm was done.

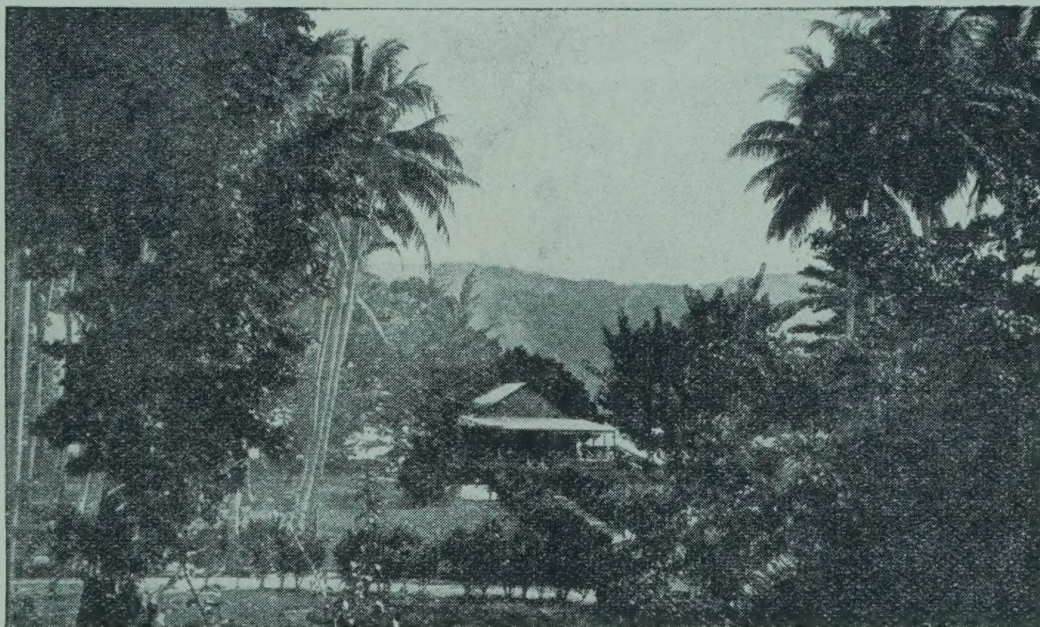
For these and other reasons, we

believe that the use of aerial railways or cableways will greatly increase during the next few years on tropical and other estates.

ACCORDING to the Report of the Madras Agricultural Department for 1911-1912, manuring experiments carried out at Samalkota tend to show that superphosphate has a good effect on crops when added to a nitrogenous manure like castor cake.

* The renowned Pitch Lake, in Trinidad (W.I.), is worked on this system. A light railway is run out over the lake (on the surface of which you can ride on horseback), and the skips on their trollies are run along by hand. When filled they are pushed back to the weighing shed, where the skip only is lifted up on to the aerial railway, automatically weighed, and then sent out three miles to sea. Arrived over the hold of the ship it, still automatically, tips over and empties itself in the hold, and returns on the "empties" line until it comes back to the shed, where it is dropped on to a trolley from which the full skip has just been hoisted, and the negroes push it out over the surface of the lake again, until they arrive at their particular hole, where it is refilled.

Papua's New Year Card to "Tropical Life."



Mr. Staniforth Smith sends the above Card to wish us "A Bright and Prosperous New Year," with the remark, "Who wouldn't be a Planter in the Tropics?" With such surroundings as the above view at Samarai, in Papua, we echo, "Who would not?"

Funtumia Rubber and its Yield.

(Continued from p. 227.)

PART III.—DR. CHRISTY'S VIEWS.

BEFORE discussing Dr. Christy's views on Funtumia, or trying to compare the respective values of the two kinds for cultivation, we like to remind our readers of the following particulars on the treatment of young rubber plantations, and the possible effects of tapping very young trees, which appeared in *The Times* from the pen of an "Ex-Conservator of Forests, India." Here we are told: "It seems very probable that [the relatively high quality of fine hard Para is due to the latex being drawn from mature trees, but on plantations very young plants are being tapped, and this may turn out to be very detrimental to the crop even in the near future.

"The tapping of pine trees for resin in the South of France seems to be a somewhat analogous process. The way they manage it is this: Up to the age of about 25 years no tapping is done, the young trees being allowed to stand densely on the ground, so that they may develop straight stems free from side branches. From this age onward the necessary thinnings are effected by 'tapping to death'—that is to say, by heavy tapping which kills or hopelessly weakens the trees within four or five years. These trees are then removed as a first thinning of the crop.

"While this is going on, the trees which, though not to disappear in the first thinning, are not destined to stand in the final crop, are tapped lightly so as not to reduce their vigour excessively until their turn comes to be 'tapped to death,' or hopelessly weakened, and removed in subsequent thinnings. But the trees which are to form the final crop remain untouched until they are about 40 years old, by which time they have attained a condition of health and vigour which enables them to yield a profitable amount of resin for a long series of years.

"Obviously, it is impossible to refrain from tapping rubber trees for 25 years; but possibly something might be done (perhaps it is done) by marking a liberal number of trees as those which it might be desired to find standing after a certain number of years (call these first-class trees), and by sparing them entirely for that number of years. Then there might be an intermediate (second) class of trees to be attacked, comparatively lightly at first, while the principal tapping would fall on the remainder (third-class trees), which, of course, would form the bulk of the crop.

"I know that the first-class trees could not be spared very long. By way of illustration, shall I assume that they might be spared for ten or a dozen years after the first tappings have been commenced? The second-class trees might be lightly tapped for half that time. Whether the third-class trees were actually killed or not by heavy tapping would be immaterial; they would be gradually removed as their presence became undesirable owing to the growth of the crop. I do not know how far such a method of treatment may be practicable, but it might perhaps be tried on a small but sufficient scale, the result being accurately recorded.

"It is possible that, as the total number of reserved trees would form but a moderate proportion of the

whole crop, the suggested treatment of them would not greatly reduce the early output of rubber; while as soon as the second-class trees, and later on the first-class trees, came under the knife, their increased development and vigour might raise the output to an amount larger than would have been obtained had they not been temporarily favoured. At the same time, it is not unlikely that the quality of the latex might be improved."

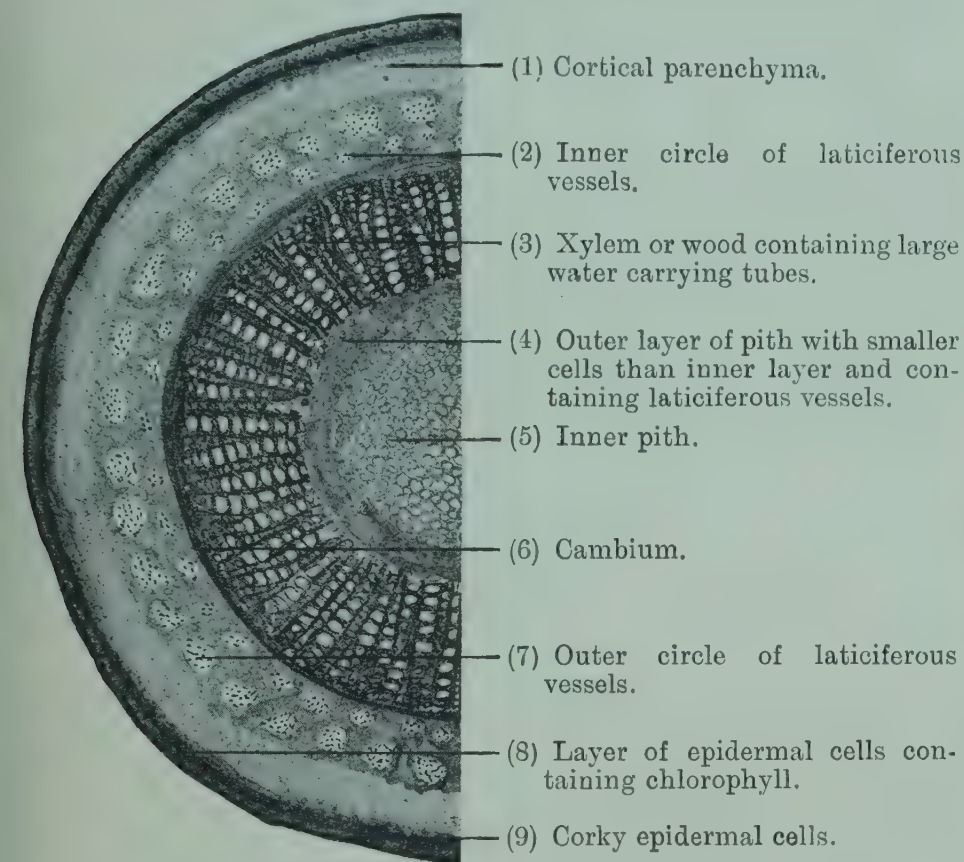
In comparing the relative value of the two trees, Hevea and Funtumia, for cultivation Dr. Christy says*: "The tendency of the Congo Government to discontinue planting both vines and Funtumia in favour of Hevea, is, in my opinion, a very serious error indeed. There are no doubt many localities in tropical Africa, where regular and ample rains occur, and, perhaps, specially in the Congo, in which Hevea will thrive, but no conclusive evidence is yet forthcoming, that its (Hevea's) yield will justify expectations based on results obtained in the East. Large plantations of Hevea have been begun in the Bangala and Equateur districts, and the tapping of these trees will be looked forward to with interest. In the meantime, since the cultivation of Funtumia is extremely easy and inexpensive, it seems regrettable that its cultivation should not have been pushed with redoubled energy not discouraged. Whatever happens and whatever the planter decides as to the relative value of the two trees, it is difficult to see how the natives can be induced to undertake the wholesale cultivation of Hevea, or of tapping it successfully when grown."

Although many do not agree with Dr. Christy in all he claims for Funtumia, his opinions are worth considering, and especially is his book worthy of the closest study, for the very arguments he advances against Hevea are, in some of our friends' eyes, the chief points where they wished to differ from him. Whilst discussing this matter we would like to say that a great many rubber men interested in planting Hevea in Africa will find Dr. Christy's book of great value, for, be it remembered, it is an account of the African Rubber Industry generally, hence its name, not merely an eulogium on *Funtumia elastica*, as many seem to imagine since Dr. Christy, who has so thoroughly and exhaustively studied this variety of rubber, was the author. One thing is certain, there is no book that contains so much information about Hevea rubber as this one, which takes each producing centre and their various districts in turn—British West Africa, the Belgian Congo, Portuguese Angola, Liberia, French Ivory Coast, Togoland, Cameroons (Dr. Christy, who is a perfect German scholar, is especially strong on the German Colonies), East Africa, where Funtumia is not found, &c. Each of the indigenous rubbers, as well as those that have been, or are about to be introduced, is freely discussed, so that in face of the great attention now being devoted to rubber cultivation in Africa, either alone or up in the interior, with coco-nuts and oil-palms nearer the sea, the book certainly deserves every consideration, whatever opinions the planter holds on the suitability of Funtumia alone.

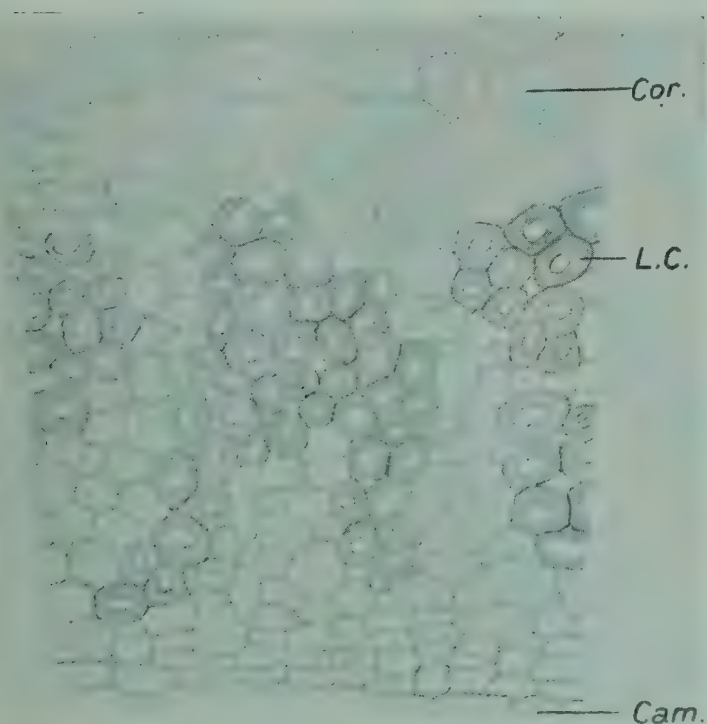
One portion of the book that interests us very much is page 56, and one in which the structure and arrangement of the tissues of the bark are described and com-

* See his "African Rubber Industry and *Funtumia elastica*," p. 25, TROPICAL LIFE Publishing Department, 13s. 6d. post free.

pared with those of *Hevea brasiliensis*. By the courtesy of the publishers we are able to show two of the figures in which the construction of the bark of *Funtumia* trees is explained; space, however, forbids us quoting what Dr. Christy has to say on the matter in the text, but his remarks can be seen and studied in the book itself.



A.—Transverse section of young *Funtumia elastica* stem.



B.—Transverse section of laticiferous area (2) and (7) of Fig. A. magnified. L.C. laticiferous cells; Cor. cortical cells; Cam. cambium layer.

AN interesting experiment has recently been made in growing cotton on tobacco lands in the province of Pinar del Rio, Cuba, says Mr. Vice-Consul Cowan. So far 6 acres have been planted and the experiments have extended over three years. The resultant product is an Island cotton of the finest quality.

The Necessity of Using Machinery on Rubber Estates.

BUY AT ONCE. DO NOT WAIT BECAUSE A BETTER MACHINE *May* BE INTRODUCED LATER.

"EVERY effort must be made by planters to ship their rubber as uniform as possible in quality, and to maintain an even grading." Thus write Messrs. Gow, Wilson in their Annual Report. "In this way it will be possible to deal with a much larger proportion of the crops by private treaty for near and future delivery, thus keeping the auctions within reasonable bounds. Visiting agents and managers generally would be well advised to bear in mind the great importance of this standardizing and grading on all estates.

"The large amount of supervision (preferably European) required in the factory to maintain efficiency does not appear to have been sufficiently appreciated in the past, and many estates have been rather *too much inclined to await the development of some possible new process before installing adequate machinery*,* which would most probably be required in the future, whatever new methods might come into use.

"The preparation of rubber generally has continued to make satisfactory progress, and it has been proved that the physical properties of the best prepared samples are fully equal to any other kind of rubber.

"Crepe and smoked sheet still form the two principal and best descriptions manufactured. In the earlier part of the year the former was in most request, and on the average realized the best prices, but partly owing to the comparative shortage of first quality smoked sheet this kind has since come into very strong demand, realizing a premium over all other sorts.

"A very large proportion of the whole crop is shipped in the form of crepe, but as the premium lately ruling on smoked sheet will inevitably cause a large increase in its production it seems unlikely that that premium will be maintained.

"The smoking process has many points to recommend it, especially as regards the strength and durability of rubber so treated. Up to the present this particular preparation has been a more cumbersome one and has taken a considerably longer time than that of crepe. Also, unless the smoking and drying have been very carefully and thoroughly carried out, the rubber is sometimes liable to arrive in a moist and mouldy condition."

"I THINK it pays a botanist or an agriculturist better to spend a month, or even two, at Peradeniya, and collect information and plants," reports Mr. Dupont, Curator of the Botanic Gardens, Seychelles, who has been on a tour, investigating tropical methods at the various centres, "than to go round the whole tropical world for the same purpose."

"I noticed," Mr. Dupont goes on to say, "a curious method of extracting oil from copra, which is first disintegrated in the ordinary way, and then placed in a battery of small metal mortars, grooved in a particular way; both the mortars and the pestles are grooved, and the extraction is said to exceed 60 per cent., being a little less than that obtained by hydraulic press."

* Italics ours.—ED., T. L.

"Grenier's Annual" and Modern Planting Methods in the East.*

THE third issue of "Grenier's Rubber Annual" arrived by the last mail in December, and fully came up to our expectations as regards illustrations, printing, and general appearance. Evidently the proprietors mean to keep pace with the F.M.S. in the increased quantity and improved quality of everything that they send forth. Such a publication is quite a text-book on up-to-date rubber estates management, only instead of teaching you your lessons by means of pages of tables and printed instructions, it does so by means of illustrations taken on the spot to show how the leading estates are utilizing the latest inventions for perfecting the preparation of their crops, or are following out our suggestions to plough, cultivate, manure, and wide-plant their estates, as outlined in our "Soil and Plant Sanitation on Cacao and Rubber Estates." When this book appeared, many of the popular experts expressed disapproval of the excessive care and caution we advocated, but the most successful estates have adopted them. Linggi stumped and ploughed and paid 820 per cent. dividends in six years, and now "Grenier's Annual" shows us how ploughing and cultivation is carried on between the trees on the Pelepah Valley, Passir Jinggi Estate, &c., and illustrates the disc harrow at work elsewhere. We also see how drains are laid and water conserved on the North Hummock Plantation. A very modern touch is included in the Chemists' bungalow on the F.M.S. Company's estate, the smoke-houses on Matang d'Jambu, Edinburgh, Seaport, and other estates, and the fine Coolie lines on Tremelbye, Edinburgh, and elsewhere are also shown. Other interesting illustrations show how Sungei Uar Estate has terraced the hillside to prevent the soil being washed down and lost, how motor lorries for transporting the rubber for export, and imported supplies for the estate, are now used, whilst the manager and head assistant use cars to get about in.

As stated on pp. 4 and 5 of "Coco-nuts, the Consols of the East," it is unwise to stint the cost of erecting the buildings on an estate, especially the quarters for the manager and staff. That leading men agree with this opinion is proved by the photographs of the manager's bungalows on Jong Landor, Pelepah Valley, Linggi, Seaport, and other estates. These show, we are glad to see, that those now engaged in developing the resources of the tropics believe in fresh air, hygiene, and comfort. We old stagers, who were brought up on the "fight-it-out," and "grub-along-as-best-you-can" system, can fully appreciate the modern estate buildings and realize how conducive they are to steadier and more strenuous work, without being unnecessarily luxurious, or rendering estate life in any way a "soft place."

Among those who have contributed articles to the Annual are Mr. S. M. Gluckstein, who discusses "The Rubber Position," Mr. Arthur Shephard, who criticizes the Brazilian Government's scheme to reform their Rubber Industry, Mr. J. F. Ashby, who considers "Rubber Costs and Commissions," and Mr. Sidney Pearson, who writes on "Rubber Dividends." Our

Editor wrote on "Modern Drying Methods," but Mr. Grenier tells us that he has decided to use the article in his "Monthly," and so did not include it in the Annual.

"Tropical Life" at the Play.

BEING the end of December, and wishing to be seasonable, we paid a visit to the Garrick to see Miss Mavis Yorke, most impish and elusive of "Will-o'-the-Wisps," act and dance in the Christmas play, written by Messrs. Clifford Mills and John Ramsay, entitled "Where the Rainbow Ends," and enjoyed our evening immensely. For so young an actress, the skill, and also the physical energy, that she showed herself to possess during the performance, for she was constantly on the boards after the first scene, gave good promise of what can be expected of her later on—if she does not overdo it in the meantime. Miss Mavis Yorke certainly made an ideal "Will-o'-the-Wisp," flitting and skipping here and there, whilst Mr. James Carew (who, it will be remembered, married Miss Ellen Terry) took the dual part of "The Genie of the Carpet" and "Captain Carey." Other characters that attracted us were "The Slacker" (Master Hereward Knight), and "The Slithershine" (Mr. A. Charlwood), and so did *the* "Caterpillar," whose name, however, did not appear on the programme. The way in which the "Caterpillar" moved its legs was almost sufficient to make one believe in the Chinese idea of transmigration of souls, and of our friend having assumed other shapes in the past. The scenery, needless to say, was beautifully painted, "The Lake at the End of the Wood," perhaps, being the favourite; but "The Dragon Wood" and "Where the Rainbow Ends" ran it very close. That the play has become as great a favourite with the public as with ourselves is proved by the heavy advance booking.

Economic Zoology.

Conducted by FRANK FINN, B.A., Hon. F.Z.S.

BREEDING FOR FUR.

THE production of fur is usually considered to be one of the special perquisites of those high northern regions where the coat of fur-bearing animals naturally attains its finest development; but the increasing depletion of these has tended to reduce fur production to very much humbler creatures, and animals of more southern habitat than the sable, fur-seal, and so forth. The leading fur-bearers of to-day are the domestic dog, cat, and rabbit, under various aliases, and such humble wild beasts as the squirrel, opossum, mole, and skunk. There are, however, a few creatures inhabiting warm climates whose fur is a marketable product; most noteworthy perhaps is the coypu (*Myopotamus coypus*), a beast especially well known in the Argentine, and familiar in the fur trade as "Nutria," the Spanish name for otter. The coypu resembles the otter (and fur-seal, too, for that matter) in having a coat of fine and valuable fur concealed under an overlying garment of coarse hair; but, although a water-animal, it is not related to the otter at all, but is really a kind of giant water-rat, as large

* Price, 3s., or 3s. 4d. post free, from TROPICAL LIFE Publishing Department, London, or Messrs. Charles Grenier and Sons, Kuala Lumpur, F.M.S.

as a dachshund. It will thrive in any climate, hot or cold, and breeds freely in captivity, the young being born well furred and with their eyes open, not naked and blind like the young of most rodents. Roots, corn, waste bread, and vegetables are good food for this accommodating beast, and the only expense to be incurred in keeping it is the provision of secure iron fencing—for it will cut through any wire-netting and burrow under any but a brick or concrete foundation—and the supply of bathing accommodation, in respect of which it is to be noted that a small but clean water supply is more desirable than a large pond which is allowed to become foul.

Those planters whose hill estates extend up into a climate cold enough to be frosty in winter might well undertake the breeding of foxes for the production of the extremely valuable silver-fox fur, foxes being easily fed, especially abroad, where the offal of the numerous fowls used for food would be available, and good destroyers of vermin, such as rats and mice, while they would not damage any ordinary crops. A very good account of the breeding of foxes for fur is to be found in Mr. E. Thompson Seton's "Life-histories of Northern Animals" (New York, 1909), the beasts of Manitoba being meant; it is a reprint of an article published in *Country Life* in 1905. From this it appears that American breeders are well on the way to domesticating the American red fox (*Vulpes fulvus*) which is practically only a local race of our familiar animal. The object, however, is not to breed red foxes pure and simple, whose value is but small, but to fix the very valuable black or "silver" variety—the silver form having a frosting of white tips to the hairs. This occurs as a freak among litters of the red fox, either typically, or in the form of the "cross" fox, which is only partially black, and, of course, far less valuable. A pair of blacks or silvers may only breed reds, but by selection the valuable black coat can be fixed, and such a strain of pure silvers can be and has been raised in five years.

Such animals are, of course, very valuable; silver-fox skins were quoted in 1904 in the *Winnipeg Commercial* at from 50 to 200 dollars each, and with the extending market that would follow increased supply and lowered prices, Mr. Seton thinks that silver-fox fur will always be a remunerative article to produce—even as ostrich feathers have proved, it may be said.

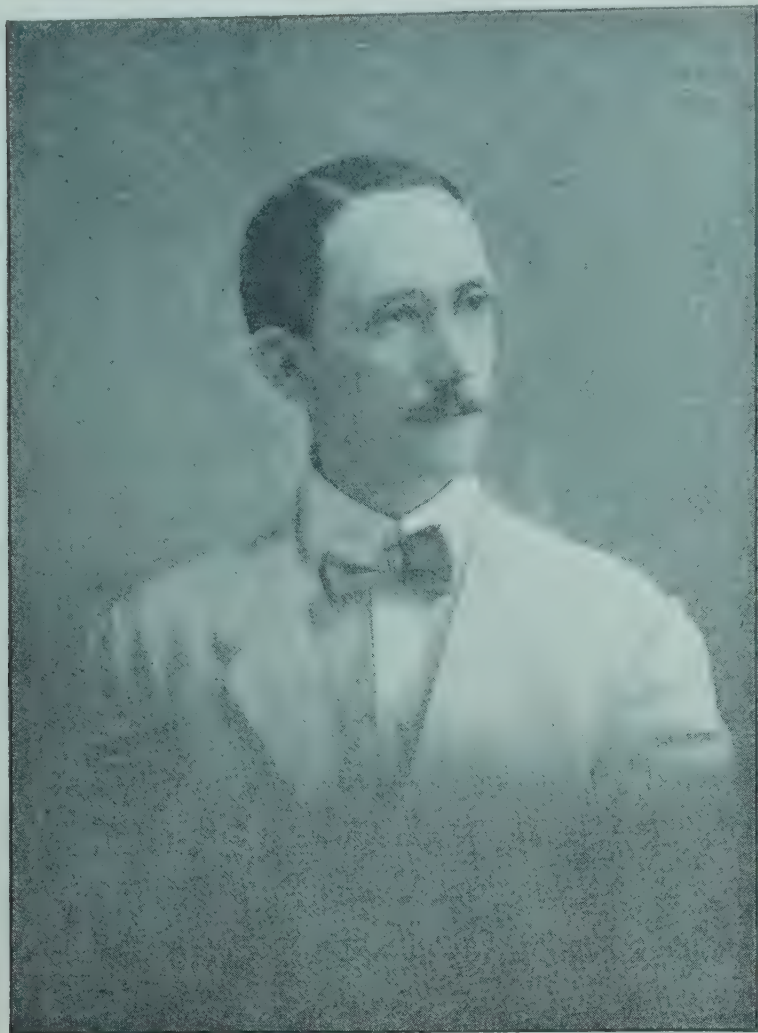
Stock foxes are expensive to procure, the prices quoted by Mr. Seton being 300 to 400 dollars a pair for silvers, for it must be remembered that at present "a fox whose pelt is valued at 100 dollars is worth 300 as a breeder." A certain amount of expense also has to be incurred in fencing; the mesh of the netting must not be less than $1\frac{1}{2}$ in., and the fence not less than 6 ft. high, with the bottom carried a yard underground and an 18 in. overhang at the top, for foxes climb like cats; and the enclosures should not be less than 10 yds. square, each breeding female being allowed this space, with some larger runs for non-breeders and young. Either one-third or one-half of the matings turned out fertile according to the different statements of the two breeders from whom Mr. Seton draws his facts, Messrs. E. Norton and M. F. Stevens, of Dover, Maine, whose premises he inspected in 1905.

INTRODUCED BIRDS AS CHECKS ON INSECTS.

DURING 1912 two very interesting papers have been published on this subject, Mr. W. Froggatt, Government Entomologist, contributing one on the "Starling" to the *Agricultural Gazette*, of New South Wales (p. 610), in which he maintains that the bird is a doubtful acquisition as an introduced species, feeding as it does so largely on fruit as well as insects; while on the other hand in the *Proceedings* of the Hawaiian Entomological Society (p. 169) Mr. W. A. Bryan advocates the introduction of foreign birds to cope with the insect pests, against which the native birds are of little use, being confined as they mostly are to the forest or shore.

A similar state of affairs existed in New Zealand, and this, as well as reasons of sentiment, induced the importation of British birds to that colony, where they are now much complained of. It is a case of the rise of the new "generation that knew not Joseph"; old colonists point out that the insects were very much worse than the birds which have to a great extent destroyed them. Messrs. Hutton and Drummond, in "Animals of New Zealand" (revised edition, 1905) give prominence to this aspect of the question, and have a good word even for that most-abused of introduced birds, the house-sparrow, saying that without it, "or some other bird equally common, the colony would be over-run with the insects again, and life would be insupportable . . . it cannot be admitted that the introduction of this bird was one of the mistakes of acclimatization. Those who urge that the sparrow ought to be banished should name a substitute." Again, in 1912 a paragraph went the rounds of our Press, in which it was stated that the sparrow, most particularly abused in America, had proved on some farms in the Western States the most vigorous enemy of the alfalfa weevil, which insect is menacing the prosperity of the growers of that important crop.

It is thus evident that the last word has not yet been said on the subject of introduced birds as foes to insect pests; few birds that are capable of becoming common enough to be of real use in this connection are free from faults in connection with fruit or grain crops, but if it is a question of a plague of birds or a plague of insects, there is no doubt but that the former are more easily controlled; they can at least be shot, netted, or scared away, and their bodies can be used for manure, or locally for pig-feeding. This, of course, applies to birds not generally sought after for plumage, food, or caging, such as the sparrow, starling, and Indian house-mynah (*Acridotheres tristis*), also a widely-introduced bird against which much has been said. But a wiser plan would be to introduce into such tropical countries as need insect-destroyers birds of gay plumage, which would be sought after for the plume and cage-bird trade. Among such, America could supply the Blue-bird (*Sialia sialis*), Nonpareil (*Cyanospiza ciris*), Superb Tanager (*Calliste fastuosa*), and Red Cardinal (*Cardinalis cardinalis*); and Asia the Pekin Robin (*Liothrix luteus*), Green Bulbul (*Chloropsis aurifrons*), Niltava Flycatcher (*Niltava sundara*), and Gold-backed Woodpecker (*Brachypternus aurantius*). Of these the first five could easily be procured and carried in almost any number, while skilled aviculturists would have no difficulty in procuring and landing the others in smaller consignments.



"Tropical Life" Friend.—No. 91.

P. J. WESTER.

Horticulturist, Department of Agriculture, Philippine Isles.

THE Bureau of Agriculture of the Philippine Islands is to be congratulated upon securing the services of "Our Friend," Mr. P. J. Wester, as horticulturist. Mr. Wester brought to the Bureau an unusual amount of enthusiasm and knowledge in the line of tropical fruit and vegetable work, and is rapidly getting hold of the complicated problems of that country.

Born September 23rd, 1877, in Arbrå, Helsingland, Sweden, Mr. Wester received a public school education in his home country and graduated in 1896 from the Gefleborgs Läns Folkhögskola, Bollnäs, Sweden. His technical knowledge of plants has been acquired through self-study, and he is essentially a self-made man.

At the age of 20 a tinge of the old wanderlust of the Vikings began to assert itself, and in 1898 he emigrated to the United States. After having spent six years acquiring a practical knowledge of horticulture in New England and Florida, Mr. Wester was appointed special agent in the Bureau of Plant Industry, United States Department of Agriculture, in 1904, and after four years' experience in the field work of the Subtropical Laboratory and Garden at Miami, he was placed in charge of that institution in 1908. Thence he was transferred to Washington, D.C., in 1909, in charge of the avocado investigations, together with other tropical fruit work there. He was again detailed to Florida late in 1910, where he shortly afterwards received a call to take up the horticultural work with the Bureau of Agriculture at Manila, Philippine Islands.

While at the Subtropical Laboratory in Miami, Florida, Mr. Wester assembled the first and the largest avocado

collection that had hitherto been made, and has probably done more than any other single man to improve and popularize the methods of a sexual propagation of this fruit. He discovered the entomophilous and dichogamous character of the flowers of the cultivated species of anona in 1907, and subsequently hybridized certain of these species, some of which hybrids will probably fruit in one or two more years. In connection with this he worked out the requirements for propagating several species of anonas vegetatively in utilizing them as stocks for each other. The large anona and guava collections now in the hands of the Department of Agriculture in Florida are largely due to his efforts.

Mr. Wester was one of the first horticulturists to recognize the coming importance of the roselle for culinary purposes, and recent interest in this plant throughout the frostless regions of the United States is largely due to his work and writings on this subject. In a paper published in 1906 he called attention to the correlation of the flower and fruit structure of *Carica papaya*, and that this fact can probably be utilized in the breeding of a variety capable of reproducing itself to seed of this exceedingly variable species. Early recognizing the need of knowledge of vegetative methods of propagation of the tropical fruits as being the first step towards their amelioration, much of his time at the Subtropical Laboratory was engaged in experimental work of this character, and many valuable results obtained. His most recent work along this line is the successful shield-budding of the cacao, which can best be appreciated when it is known that at present practically all cacao estates are planted with seedlings. Cacao has been successfully in-arched and patch-budded in the West Indies, but these methods of propagation are too cumbersome and complicated for general adoption, and they have, on that account, affected the cacao industry but little, if at all, in standardizing the product.

A bulletin on the mango, by Mr. Wester, has just been issued as Bulletin No. 18 of the Bureau of Agriculture. Apart from this, many papers on horticulture and related subjects have been published by him from time to time. It is perhaps safe to say that few men have the familiarity with so large a range of tropical fruits and other economic plants, their cultivation and uses, as our friend can lay claim to.

While poor health has for about two years somewhat interfered with Mr. Wester's studies, his residence in the Philippines has brought about a great change for the better. If his health continues to improve, and if his hand and heart can keep up with his head in tropical horticulture, we may look forward confidently to still further activities of which the tropical world may well be proud.

In order to encourage the use of machinery and labour-saving appliances on estates in the Tropics, there is some talk of offering five gold medals for the best samples of (1) copra, (2) coco-nut fibre, (3) sisal fibre, (4) Ceará rubber, and (5) robusta coffee; to be competed for at the coming Cotton, Fibres, &c., and Rubber Exhibitions, to be held in June, 1914, provided such produce has been mechanically prepared, and not merely sun-dried or cleaned by hand. A sixth medal may also be placed at Mr. Staines Manders' disposal to be awarded to the most efficient spraying machine for use on tropical estates.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

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4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JANUARY, 1913.

The Disposal of Tropical Produce.

PUBLIC SALE *v.* PRIVATE TREATY.

THE question as to the best means of disposing of the produce from an estate, be it rubber, cacao, or what not, has caused almost as much breath and excitement to be expended over it as the question of Home Rule for Ireland . . . and like that evergreen subject, we are still as far from arriving at a satisfactory agreement as ever. Should, however, the estates ever try to eliminate Mincing Lane and its public auctions (leaving out other centres) we are quite sure the brokers would rival the Ulsterites in their sturdy opposition to such a radical change, only instead of Sir Edward Carson, we should have Mr. Andrew Devitt, and Mr. Figgis for Mr. F. E. Smith.

We have had nearly thirty years' experience of the advantages and disadvantages of the system of disposing of the produce of tropical estates under the hammer at the Commercial Sale-room in Mincing Lane, and have had many an argument with planters who insist that selling locally, or on c.i.f. terms, saves time and trouble, if, indeed, it does not actually put a larger amount of net proceeds in their pockets in the end. The chief advantage they look for, however, is the saving of time and trouble.

All agree, however, that, if some producers did not send the whole or a portion of their crop to be sold in public, and so allow the market values obtained by such means to be wired the same day to every producing centre that will pay for the cost of doing so, those selling locally could not obtain the full values they do, or be able to base their prices on London rates, against which no one can raise any objection as a working basis. Anyone doubting this has only to go to some out-of-the-way centre (if there are any such

places left) where the sellers are unaware of these London telegraphic rates, and see how erratically they are paid, and how completely they are at the mercy of the buyers, especially if he be a Chinaman, whose ability to learn current rates at consuming centres seems to be unchecked, be he in ever so distant a spot away. Unless there was local competition, or the buyer showed anxiety (for there is nothing that a native notices so quickly in the buyer as anxiety to obtain the goods), prices in the old days at the producing centres were more out of proportion to those obtained in London, and the middlemen obtained larger profits thereby than are possible now. To-day the most unsophisticated native, in the uttermost backwoods, hole or creek, seems to know far more of prices than buyers care for; but even with educated planters, who move about the world freely and often, if the public auctions of London were suppressed, and the London cabled prices knocked out of existence, the biggest planter would be almost entirely at the mercy of the buyers, and never be able to contradict them with such certainty as they can now do when they know the price offered was unfairly low. For these reasons, we unhesitatingly maintain that public sales, and their cabled-out prices, are as essential to the well-being and prosperity of the planting world as the daily press is to the general public. The suppression of either of them can only be brought about to the detriment and loss of the planter or the public.

"The larger auctions were without doubt greatly assisting the importer and manufacturer by reducing the chances of wild and unwarrantable fluctuations in prices, which had in the past been so detrimental to the best interests of the industry and robbed the market of the stability so essential for its normal development," report Messrs. Gow, Wilson in their Annual Rubber Report for 1912.

By these remarks we do not mean to infer that the whole of one's crop must necessarily be offered at public sale, any more than we should dream of advocating that the whole of a city's news, its treaties and scandals, should be included in the columns of the daily paper. Every leading estate would be wise, however, to regularly offer a percentage of its output at public sale, in order to keep the mark before the public (interested in their goods), and so establish a price to which no exception can be taken as regards its being the *bonâ fide* value of the goods offered, and by means of such prices to keep buyers in check on the other side when they try to force values to too low a level. Another, and perhaps the greatest of all advantages in favour of the London public auctions, is that they always give the planter a second string to his bow to utilize when local prices are too low compared with those reigning overseas. When such is the case, if the planters were to ship their produce regularly for a mail or two, and offer it at public sale in London, or even if they threatened to do so, and the buyers knew them to be in earnest, such an action would be bound to break up any "ring" or agreement between the buyers, and place them entirely at the mercy of the planters, instead of *vice-versâ*, as is the case when planters are ignorant of prices and movements in Europe and America. Again, buyers sometimes are unable to take delivery, which means that when the

market moves in the planter's favour and against the buyer, the former, instead of realizing a greater profit, may be put to loss and inconvenience by having to find another purchaser locally. With auctions elsewhere, the planter can ship any quantity of produce, either drawing against it, or receiving a remittance in advance to tide him over until the goods are sold. Far better off would such a man be than another who, disappointed in his original buyers, has to go round begging and praying for another to get him out of "his hole." If anyone can show that, by these few remarks, we have exaggerated the value of public auctions, we shall be glad to hear their views to the contrary.

Compulsory Measures for Spraying Cacao, Rubber, &c., Trees.

GREAT interest is being manifested throughout the United States with regard to plant sanitation and the spraying of trees and bushes of economic value, several of the States even going so far as to pass laws compelling the producers to spray their trees, &c., if necessary, as when they have been attacked by pests. Every fruit grower, with practical experience, quickly learns to appreciate the advantage and value of such a law, and although such realize the necessity of spraying their crops, and most of them do so, yet some compulsion is still necessary, as we explain in our book on "Soil and Plant Sanitation"* to force the careless or ignorant farmer to keep his trees free of disease, lest the trouble spreads from his neglected piece to his neighbours' lands where everything has been, and is being done, to keep the trees in good health, and so enable them to utilize all their vigour in putting forth large yields of good quality produce.

When this is not done, it is soon noticed that those whose lands border on the estates of careless planters, sooner or later suffer from the neglect or parsimony of the owners of unsprayed trees, which prove perfect havens for breeding pests which are then distributed around to the four winds, and thus infest the trees of the careful planter, reducing his output and increasing the cost of upkeep.

If this is true in the United States, which have the advantage of frosts, and periods of rest, when insect life is killed off, or quiescent so far as breeding and multiplying are concerned, it is doubly true on cacao, rubber, tea, coffee, coco-nut, cotton, and other estates in the Tropics.

And yet, although the position has improved considerably during the last year or two, tropical planters, outside those under scientific European and American management, are still woefully negligent of and indifferent to the health of their own trees, or of the harm, started on their own estates, they may do to the neighbouring ones.

The advent of the scientist, however, is helping to spread the gospel of health throughout the Tropics, as it has done elsewhere, and the work done by the Dutch against the witch-broom disease in Surinam, and of the English and Americans on estates owned

by them elsewhere, has aroused considerable attention to the profits to be obtained from spraying the trees and keeping them free of disease and pests. In the cotton-producing world alone, the wonderful results obtained in the American cotton belt, where spraying is practised, particularly when waging war against the cotton worm, has proved a valuable lesson to cotton-growers everywhere, and an incentive for them to "go and do likewise."

Our friends the Deming Co.* to whom we wrote the other day regarding the increasing demand for their goods, tell us that they find their sales have increased tremendously of late, and that they find planters much more willing to listen to suggestions about spraying their trees, and to follow up the advice tendered, once those offering it have proved their ability to diagnose the trouble, and its cure, thereby gaining the confidence of those planters with whom they come into contact. From this and from what we gather from our exchanges, makers of reliable spraying machines seem likely shortly to be having the time of their lives, as the next two years or so will be extremely important ones in tropical development. Those firms, therefore, who have been working with us, and explained the advantages of their spraying apparatus in the various hand-books on tropical agriculture that we have published, will find the demand for their goods increase, whilst planters generally will benefit from the higher standard established throughout the Tropics as regards plant-hygiene and sanitation on the estates.

Suction Gas from Estate and Jungle Waste.

SPECIALLY SUITABLE FOR COCO-NUT ESTATES.

IF there is one thing more than another that has been recognized by all coco-nut planters worthy of the name of "practical," it is the fact that all refuse on coco-nut estates, be it condemned trees, leaves, or other rubbish, must not only be removed, but should preferably be burnt, as being more thorough, certain, and cheaper than burying them. When one looks at, or even troubles to realize, the size of a coco-nut tree, its stem, crown, or leaves, it is not difficult to understand the trouble and cost of burying such débris, especially to do it properly; that is deep enough to prevent the beetles breeding under the soil and then finding their way to the surface to give trouble to the still unaffected trees. Since, therefore, the refuse must be got rid of, and the planter

* That is the Deming Company, of Salem, Ohio, U.S.A., probably the largest and the most reliable manufacturers of spraying apparatus in the United States, whose estate supplies comprise everything from the small brass bucket spray pump to the large power machines, their catalogue showing twenty-seven different varieties of spray pumps and thirty-seven different nozzles and attachments. Those interested in these goods should write for a copy of their beautiful 36-page catalogue, printed in two colours upon heavy enamelled paper with clear half-tone illustrations and a 12-page bond paper spraying chart telling how to make and when to apply remedies for different trees. This catalogue, the Company advise us, they will gladly send out to anyone who is genuinely interested in fruit-growing, &c. The Deming Company have been in business for thirty-two years, and their advertisement has appeared regularly in our Journal for some time past. We believe our readers will benefit by writing for this catalogue, saying how many trees, &c., they want to spray, and asking for advice on anything pertaining to spraying mixtures, spray pumps, &c., about which they may be in doubt.

* Price 11s., post free, TROPICAL LIFE Publishing Department.

wishes to avoid burying it if possible, only one alternative remains, *viz.*, to burn the stuff, especially if, as suggested on p. 235 of our book, the damper portions, as those affected by bud rot, &c., could be first scorched and so partially dried in a charcoal-making apparatus.

Let us say, therefore, that the refuse can be and must be burnt, in which case the very natural question arises as to how this can be done most economically, so as to cost the planters as little as possible. We propose to answer the query by recommending that it be utilized for making suction gas. This will certainly cost some money as it requires a special plant, which has to be imported, but the results arising from the outlay, *viz.*, gas for motive power, either to be used direct or, what perhaps would be best, to drive a dynamo, and utilize the electric power thus obtained, will more than repay any outlay.

To achieve this object three things are necessary:—

(1) Charcoal maker (an improved apparatus to the one illustrated in our Coco-nut Book, p. 235, is, we believe, shortly to be placed on the market).

(2) Power saw-mill.

(3) The suction gas plant and gas engine.

The charcoal maker, as a rule, would be needed only in cases of diseased trees or leaves when it is necessary, as already explained, to at least char if not burn them before their removal to the suction gas factory, or rather to the saw-mill shed, through which everything will have to pass before being utilized as raw material to make suction gas. In the saw-mill shed all the material, be it tree-trunks, palm leaves, jungle-clearance bush, or husks, off the estate, must be sawn into pieces not exceeding 9 by 9 in., otherwise they will not be available for use in the gas generator. A mixture of large, medium and small fuel is best, as it is impossible to run the engine on all 9 by 9 in. pieces, or even 6 by 6 in. cubes, as such sizes would leave the fire too open. Having secured a supply of cut-up wood sufficient for a start, whilst leaving the saw-mill gang to continue their work, the gas-generating gang, having lit a fire in the generator with wood, proceeds to pack the gas-producer with material, either the cut-up wood, husks, charcoal, or nut shells, preferably a mixture of the four. This done, they then start to turn the hand-fan or blower on the generator, in order to create a bed of hot fuel. It should take about ten to twenty minutes to arrive at a temperature sufficient to give off a suitable gas (at the test cocks on the gas plant and engine) that will now start the gas engine.

It might be stated here that all the time the blower is being turned the gases and smoke are passing along and up a waste gas-pipe, but not to the engine. On starting the engine this waste pipe is closed, and all the good gas which is afterwards made passes into the engine cylinder.

Water is required in the "scrubber" of the gas plant a few minutes before starting the gas engine, and is necessary for the cleaning and cooling of the gas, the amount required being $1\frac{1}{2}$ to 3 galls. per horse-power per hour, varying according to the fuel used, *i.e.*, the more wood the more water required, and *vice versa*, the less wood the less water. Should water be scarce the above quantity may be consider-

ably reduced by pumping up the used water to a tank overhead, after having filtered it through sand or other suitable medium. The only attention necessary after starting (the hand blower having been stopped about five minutes after the engine is set running) is the labour required to charge the gas generator at intervals, say about every hour, or thirty minutes, according to the fuel used. At the end of the day's run the engine may be stopped and the waste gas-pipe partially opened (to cause a slight draught to play on the gas generator) in order to keep the fire alight until the morning. The cost of an engine and plant would all depend upon the power requirements. Such plant and engines as we have described are made in all sizes from 10 horse-power to 300 horse-power, the 10 horse-power generating 800 cubic feet of gas per hour (the quantity required for 10 horse-power in one hour), at a cost of about £180 in England for the suction gas plant and engine, plus freight and charges to the Tropics, and the cost of transport and erection on the other side. According to other estimates, assuming that 50 B.H.P. were to be developed, the whole installation including engine with pipes, bolts, and tanks ready for work, and wood gas plant would cost about £650, plus freight and charges to the Tropics, also cost of transport and erection over there.

The consumption of fuel with such an installation, assuming 30 per cent. moisture, can be taken at $2\frac{1}{2}$ lb. per B.H.P. per hour at full load. The plant would give gas corresponding to 4,000 cubic feet per hour or 40,000 cubic feet over ten hours; equal to 500 B.H.P., and such engines and plants are made in all sizes to develop from 20 to 350 B.H.P.

Having obtained your gas cheaply, no modern agriculturist will deny that it can be used to great advantage in a multitude of ways, either directly or indirectly through a dynamo. Machinery to-day is a *sine qua non* on every estate that is to show a profit. Should anyone doubt us we will go elsewhere to confirm this statement.

"Modern machinery has vastly increased agricultural effectiveness," the *Leader* of Nairobi (quoting *Suffern's Quarterly*) tells us, and when the reader takes stock of the following list, he can see at a glance that in most cases suction gas could be used as the fuel.

"Wherever land is farmed in large fields that are comparatively level, the tractor engine is another word for economical operation. One chief service the tractor renders is that of drawing implements in gangs. Plows, crushers and packers, disks, seeders, harvesters, all are drawn in groups of their own sort, or in combination groups. To cut and bind grain, plough the cleared stubble land and disk it, all in one operation, thus preparing for another crop while caring for the preceding one, is merely typical of the economy of time and labour effected through the tractor. One engine easily does the work of ten men and twenty horses.

"Gasoline engines seem to be the more common, but kerosene engines, which are later comers, are a close second. The kerosene engine is cheaper in operation. Following the advent of the small explosion engine, the portable sawmill has taken the place of the man with the sawbuck and axe. The silo

cutter and filler have become more workable. Often the small engine displaces the windmill for pumping—the more so as it can be worked at any time, and can be geared up with all sorts of accessory machines—clothes washers, fanning mills, emery wheels, churns, what not.

“Further uses for such engines are found in the production of pressure for water service and fire protection; the operation of vacuum milkers, cream separators, &c., the pumping of water for tile, ditch or overhead irrigation, or for flooding (as in the cultivation of cranberry bogs), the working of spraying machines, of sickles and binders upon harvesters, and of portable elevators, used for emptying grain from wagon to crib or granary to wagon. This invention has resulted in higher and larger granaries and cribs.

“The small engine also generates electricity for power and lighting. This employment is now the more feasible because of recent improvement in storage batteries. Hence electricity is assuming great importance on the farm. For purposes as remote as running of a clipping machine for giving a horse a haircut, and the lighting of house, stable and grounds, electricity is now available, and any electrical equipment for shop or household that is procurable in town is also possible on the farm equipped with a small engine supplemented with storage batteries. As a labour-saver and time-extender (through lengthening possible working hours), electricity is an important intensive agency.”

Certainly, it seems to us, a good day is coming for suction gas plants, especially to develop electric power.

New Year's Greetings from Pitcairn's Island

To show how thoroughly TROPICAL LIFE penetrates into, and permeates the whole of the tropical and sub-tropical zone, we reprint here the following letter dated October 11th, 1912, that has just come to hand from Pitcairn Island in the South Pacific, noted as the place where some of the mutineers from the *Bounty* found an asylum in 1789, after they left Tahiti.

“I have received your interesting letter of December, 1910,* and will give you a little idea of our life on the Island during the different seasons of the year. We plant different kinds of tropical fruit such as bananas, oranges, pineapples, &c., &c., and of vegetables such as potatoes, cabbages, onions, beans, pumpkins, and other kinds. Our climate varies only according to the wind, and is warmer when the wind is northerly, cold when southerly, mild when it is in the east, and moderate with the wind in the west. The health of the inhabitants is completely good. Our occupations are farming, carpentering, fishing, and helping one another in different ways. The children play games of various kinds, and help in the little duties in the house. The ships which visit us are very few, and our communications with the outer world are few and far between. The planting season runs from August to March. With best wishes to you.

I remain, your affectionate friend,

GERARD ROBERT BROMLEY,

Chief Magistrate, Pitcairn Island.

Annual Review of the India-rubber Market, 1912.

By Messrs. S. FIGGIS AND CO.

SMOKED RUBBER ON THE INCREASE.—“HIGHLANDS ESTATE” THE IDEAL.—BEWARE OF UNPLANED PACKING-CASES WITH THEIR SPLINTERS.

OF Plantation rubber grown in Ceylon, British Malaya, Sumatra, Java, India, Borneo, &c., we give the following figures:—

Exported	1912.	1911.	1910.	1909.	1908.	1907.	1906.
From Ceylon (& India)	6,300	2,750	1,430	600	350	230	160
„ Malaya, &c. ...	22,200	11,400	6,800	3,250	1,450	780	350
Total (tons) ...	28,500	14,150	8,230	3,850	1,800	1,010	510

Brazil continues to supply us freely, and some of the “Amazonas” districts show a good increase, the total shipments from Brazil, including Bolivia, Peru, Mollendo, Maniçoba, &c., we estimate to be: 1912, 40,500 tons; 1911, 39,500; 1910, 40,500; 1909, 42,000. The demand for Plantation rubber (as we remarked in our last annual review) has been excellent throughout 1912, and practically the whole of the largely increased supply has gone to consumers. The more frequent and larger selling “forward” has been a considerable factor in manufacturers’ buying so largely and readily for their wants as they come under contract. But the great care and improvement in preparation by most planters has also been a strong inducement to consumers of Plantation. The demand for tyres for motors and cycles has increased enormously. We congratulate the managers on the general splendid output and quality. Ceylon at last shows a very marked increase; South India and Mergui also, of very nice quality. We estimate 950,000 acres under rubber cultivation in the East—part will, no doubt, revert to jungle—but of the probable 110 million trees, only a moderate proportion has been tapped up to now. Many estates wisely continue to employ mycologists to study diseases and watch remedial measures—we hear of fewer complaints of “fomes.” We urge that all rubber be packed loose and dry, flat in lengths of the cases, and not doubled over or twisted. 17,600 tons have been sold in the auctions held here every fortnight. Rubber should not arrive mouldy and damp, as such will not pass as “fair average” quality. The proportion of “smoked” rubber has greatly increased and it is liked, if well done of uniform colour and not oversmoked and sooty. Fine smoked sheet should be ribbed and even, like “Highlands,” which has realized high prices. Rubber should be washed as clean as possible, and very small lots of different descriptions are not liked. Lots of under 4 cwt. are sold as “star lots” at the end of the auctions. The cases should be strong, 1 to 2 cwt. seem regular sizes, but perhaps double that size may be found suitable as quantities increase. No paper or fuller’s earth should be used. Cotton adhering to rubber from the presses is very much objected to and depreciates value. The cases should be planed smooth inside, to avoid small pieces of wood adhering to the rubber.

We understand some new process will be tried

* That is to say, twenty-two months from the date of the letter quoted.

to produce rubber in the form of fine that comes from Brazil; the samples we have seen appear good, and we hear the process of preparation is very rapid, but only results of imports can establish the suitability of new descriptions.

We are inclined to repeat our suggestions to "standardize" qualities into No. 1, Latex pale; No. 2, clean light brown and grey; No. 3 (from bark), dark and brown.

There has been a continued and universal extension of motor vehicles, and the world's increased supply of rubber has been absorbed. Probably 99,000 tons has been consumed; stocks now are small.

Imports of extracted rubber from Jelutong have declined; shipments of raw Jelutong were about 25,000 tons. Rambong has been in small supply and sold well; Castilloa also, but was mostly too soft. Guayule, partly owing to the revolution in Mexico, has fallen to 7,000 tons. The manufacture of "reclaimed" rubber has been very great, and as "reclaiming" is now so general, this must be considered a serious factor.

Last January good sheet sold at 4s. 11d., to-day's price 4s. 6d., smoked 4s. 11½d., to-day's value 4s. 8½d.; pale Crêpe at 4s. 11½d., to-day's value 4s. 7½d.

Our estimates of rubber plantations include:—

	1912 Acres	1911 Acres	1910 Acres	1909 Acres	1908 Acres
Ceylon	220,000	210,000	200,000	187,000	180,000
Malaya, Malacca ...	430,000	350,000	290,000	240,000	185,000
Borneo	20,000	20,000	12,000	10,000	10,000
Dutch E.I., 80,000 Java, 150,000 Sumatra, &c.	230,000	200,000	185,000	120,000	90,000
India and Burmah ...	40,000	40,000	30,000	31,000	30,000
German Colonies, Samoa (2,000), E. & W. Africa	42,000	45,000	45,000	38,000	

Mexico, Nicaragua, and Honduras, have probably planted 80,000 acres, mostly Castilloa; also Colombia, Ecuador, Bolivia, and Peru.

India is extending. More in Burmah and Mergui; the Philippines (small as yet), Samoa, Hawaii, other islands and New Guinea, Queensland small, and Seychelles little. The East and West Coast of Africa have plantations; some also in Congo region and German West Africa, also in British East Africa, Uganda, and the West Indies (probably 5,000 acres).

For Brazil, Amazonas, Bolivian, Peruvian, and (wild) medium rubber, the consumption continues to increase with the supplies, and 1912 has been an active year for manufacturers; the tyre trade is especially much bigger, as the demand for motor vehicles and cycles develops so greatly. Probably of raw rubbers 99,000 tons were used, besides great quantities of reclaimed, but less of mediums, which have not been so abundant. Europe has had a good and increasing trade, and America has very largely increased. Monthly fluctuations included:—

	Brazil Hard Fine.		E.I. Plantation First Latex Crepe.	
January	Opened ...	Highest ...	Opened ...	Highest ...
	4s. 3d.	4s. 8d.	4s. 11d.	5s. 5d.
February	Lowest ...	Highest ...	Lowest ...	Highest ...
	4s. 6d.	4s. 7½d.	5s. 3d.	5s. 3½d.
March	Lowest ...	Highest ...	Lowest ..	Highest ...
	4s. 7½d.	5s. 2d.	5s. 3d.	5s. 9d.
April	Highest ...	Lowest ...	Highest ...	Lowest ...
	4s. 11½d.	4s. 7½d.	5s. 5d.	4s. 11½d.

	Brazil Hard Fine.		E.I. Plantation First Latex Crepe.	
May	Highest ...	Lowest ...	Highest ...	Lowest ...
	4s. 8½d.	4s. 7d.	5s. 0½d.	4s. 10½d.
June	Lowest ...	Highest ...	Lowest ...	Highest ...
	4s. 7d.	4s. 10½d.	4s. 10d.	5s. 2d.
July	Lowest ...	Highest ...	Lowest ...	Highest ...
	4s. 8½d.	5s.	4s. 9½d.	5s. 1d.
August	Lowest ...	Highest ...	Highest ...	Lowest ...
	4s. 10½d.	5s. 2d.	4s. 11d.	4s. 9½d.
September ...	Highest ...	Lowest ...	Highest ...	Lowest ...
	5s. 1½d.	4s. 6¾d.	4s. 10¾d.	4s. 6d.
October	Highest ...	Lowest ...	Highest ...	Lowest ...
	4s. 7½d.	4s. 4d.	4s. 5½d.	4s. 1¾d.
November ...	Lowest ...	Highest ...	Lowest ...	Highest ...
	4s. 2½d.	4s. 6d.	4s. 1½d.	4s. 5d.
December ...	Lowest ...	Closing ...	Lowest ...	Highest ...
	4s. 5d.	4s. 6½d.	4s. 4½d.	4s. 7½d.

Pará rubber statistics for the month of December (tons):—

	Pará.	Caucho.	1912.	1911.	1910.	1909.
Receipts at Pará ...	4,170	750 =	4,920	agst 3,830	2,640	3,510
Shipments to Europe	1,760	450 =	2,210	„ 1,640	1,770	1,350
„ „ America	2,030	180 =	2,210	„ 2,670	1,340	2,940

Crop statistics, June 30th, 1912, to December 31st, 1912 (six months):—

	Pará.	Caucho.	1912.	1911.	1910.	1909.	1908.
Pará { 1912	16,390	2,670	19,060	16,010	15,780	16,710	15,750
Receipts { 1911	14,520	1,490					
„ „ Shipmts. Europe	8,330	1,860	10,190	8,490	8,660	7,590	6,980
„ „ „ America	9,020	1,290	10,310	9,460	6,850	8,840	8,410

The market has been quiet and prices slightly easier previous to the auctions on January 14th-16th, which were the largest we have had, 1,130 tons of Eastern Plantation being offered. The whole quantity sold with good competition at a penny per lb. under the sale rates of a fortnight ago. Hard Fine to-day 4s. 6½d., Soft Fine, 4s. 3½d., and Caucho Ball, 3s. 5½d. Plantation kinds up to 4s. 6½d.

Another Champion for Ploughing.

"I HAVE experimented with small areas under grass, but the results have not shaken my belief in clean weeding, to be followed by digging or ploughing whenever there is a sufficiency of funds and labour," Mr. Baxendale, the Delegate for Malaya, told his audience at the New York Rubber Congress. "With a sufficient supply of these sinews of war, the planter can hold his own, and after three or four years, aided by the shade then afforded by his trees, he becomes master of the situation." With such a strong advocate for ploughing and cultivation we hope that both the example as well as the precept will be noted and followed by our readers and tropical agriculturists generally.

THE GRAIN OF MUSTARD SEED AND ITS GROWTH.

"When I started tapping," Mr. Baxendale went on to say, "the word factory had not been invented, or, at any rate, used in this connection. I began by settling the latex in my washing basin, rolling the rubber with a beer bottle (an empty one), and dried it on the verandah. Then, acting under strong domestic pressure, I moved the scene of operations to the stables, and carried it on there until there was no room for the horse. Next I built a little shed and bought a hand mangle. The next move was to the factory of to-day.

Cotton.

THE following were the prices for Cotton in London on January 9th, according to Messrs. Slann and Davies :—

	Good Fair.		Good.		Fine.		Superfine.	Good 1912.		Compare	Good 1911.		per lb.
	d.	d.	d.	d.	d.	d.	d.	d.	d.		d.	d.	
Surat kinds*	5 $\frac{1}{8}$	to 6 $\frac{1}{8}$	6 $\frac{3}{8}$	to 6 $\frac{5}{8}$	6 $\frac{7}{8}$	to 6 $\frac{1}{2}$	—	5	to 5 $\frac{3}{8}$		7 $\frac{1}{8}$	to 7 $\frac{9}{8}$	—
Madras ...	6 $\frac{1}{4}$	to 6 $\frac{3}{8}$	5 $\frac{7}{8}$	to 6 $\frac{5}{8}$	—	—	—	4 $\frac{3}{4}$	to 5 $\frac{7}{8}$		7 $\frac{7}{8}$	to 7 $\frac{1}{2}$	—
Bengal ...	—	—	5 $\frac{5}{8}$	—	5 $\frac{7}{8}$	—	6	4 $\frac{9}{16}$	—		6 $\frac{5}{8}$	—	—
Assam ...	—	—	6 $\frac{1}{8}$	—	6 $\frac{5}{8}$	—	6 $\frac{7}{8}$	4 $\frac{7}{8}$	—		6 $\frac{5}{8}$	—	—
China ...	—	—	6 $\frac{1}{4}$	—	6 $\frac{1}{2}$	—	6 $\frac{3}{4}$	5 $\frac{1}{4}$	—		6 $\frac{3}{4}$	—	—
West Indian ...	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8 $\frac{1}{4}$	—	8 $\frac{1}{2}$	7	—		9 $\frac{1}{4}$	—	—
Sea Island ...	12 $\frac{1}{2}$	—	15	—	18 $\frac{1}{2}$	—	22	13	—		18	—	—
West African ...	6 $\frac{1}{4}$	—	6 $\frac{7}{8}$	—	7	—	—	5 $\frac{3}{8}$	—		7 $\frac{7}{8}$	—	—
East ,, ...	7 $\frac{1}{16}$	—	7 $\frac{7}{8}$	—	9 $\frac{1}{16}$	—	—	6 $\frac{7}{16}$	—		9	—	—

* Liverpool quotations.

The market opened at the beginning of the year with an improvement on previous rates of 10 points, but owing to a pause in speculative activity in New York this has not been maintained. Prices close at an average loss of 7 points from those of the last day of 1912, and the Spot quotation for Middling at 7.04d. shows a similar reduction. There has been a noticeable increase in the Trade demand, the week's sales reaching 62,000 bales. The quantity ginned to December 31 is given as 12,919,000 bales, against 14,317,000 last season. A small business is passing in East Indian at steady prices.

The import into Liverpool this week amounts to 121,539 bales, since September 1st, 2,740,275, same week last year 117,807, last year's total 2,386,317 bales. The estimated Sales amount to 62,000 bales, including "called." Middling American is quoted at 7.04d. per lb., last year 5.33d., 1911, 8.2d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.
Brought into sight ...	9,315,000	9,406,000	8,085,000
Exports from United States since September 1st—			
To Great Britain ...	2,409,000	2,295,000	2,293,000
To Continent, &c. ...	2,888,000	2,950,000	2,209,000
Total crop ...	—	16,138,000	12,120,000

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	January 9th.	Same time 1912.	Same time 1911.
	d.	d.	d.
January ...	6.78 $\frac{1}{2}$	5.15 $\frac{1}{2}$	7.84 $\frac{1}{2}$
January—February ...	6.75	5.15 $\frac{1}{2}$	7.84 $\frac{1}{2}$
February—March ...	6.73 $\frac{1}{2}$	5.18	7.85 $\frac{1}{2}$

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

PUBLIC sales were resumed on January 7th after the holidays, and during the three following days moderate quantities of all descriptions were submitted to auction; the demand was rather slow, but little change in values can be quoted, though Central American kinds were occasionally in buyers' favour. Unwashed Dumont Santos sold well. The stocks in the principal ports of Europe on January 1st, according to Messrs. Düüring and Zoon, show an increase for the month of 378,000 bags against an increase of 149,000 bags last year; the visible supplies on January 1st show an increase of 576,000 bags against an increase of 146,000 bags at the same time in 1912. The above figures had an unfavourable effect on the market for "futures," and values declined; prices have, however, since recovered, and March Santos at the close is unchanged for the week. We quote :—

The receipts at Rio and Santos from July 1st, 1912, to January 8, 1913, were 9,221,000 bags against 9,910,000 bags and 9,055,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

Nyasaland.—At 77s. to 82s. for low middling to good middling.

East African.—At 78s. for medium, 82s. for bold.

Java.—At 57s. for Robusta blacks.

Jamaica.—At 73s. for good ordinary palish.

Costa Rica.—At 73s. 6d. to 77s. 6d. for smalls, 75s. 6d. to 78s. 6d. for good to fine fine ordinary, 79s. to 83s. 6d. for low middling to good middling, 79s. to 89s. for low middling to fine bold.

Nicaragua.—At 79s. for middling.

Colombian, &c.—At 71s. to 77s. for smalls, 74s. to 81s. 6d. for good ordinary to good middling, 77s. 6d. to 85s. for ordinary to fine bold.

Dumont Santos.—Unwashed at 70s. to 71s. 6d. for smalls, 73s. to 74s. for medium, 74s. to 76s. for bold.

Fcs. 87 have been offered until February 3rd for the 300,000 bags Valorization Coffee to be sold in Europe.

		To-day	Jan. 2nd, 1913
London ...	Santos, Mar. del.	61s. 6d.	61s. 6d.
New York ...	No. 7 Rio ,,	13.48 cents	13.50 cents
Hamburg ...	Santos ,,	68 $\frac{3}{4}$ pf.	68 $\frac{3}{4}$ pf.
Havre ...	Santos ,,	84 $\frac{1}{2}$ francs	84 $\frac{1}{2}$ francs

Tea.

By Messrs. WM. JAS. and HY. THOMPSON.

DURING the past three weeks' interval the aspect has undergone a marked change for the better, the statistical position having improved very considerably from all points of view. Lighter prospective supplies from both India and Ceylon have removed any apprehension of an excessive import, and the official trade figures for the past month indicate a stronger and more healthy position. A more favourable view has therefore been created amongst both sellers and buyers, and this has been reflected in the tone of the market, which re-opens with a better demand and a distinct, though somewhat irregular, upward tendency in prices for all but lowest medium and commonest qualities.

For all good tea the market is strong and is likely to continue so, the supply being small, and a paucity of attractive quality is promised in the near future. A few autumnal Dooars have this week found a ready and eager market, and have realized very good prices. Opinions differ as to the course of the market for common tea, but deteriorating quality from Ceylon will shortly bring larger supplies within this category, and the steadying influence of increased imports from Java are not hopeful signs. Generally speaking, the year starts under favourable conditions, but a more substantial increase in figures for Home consumption would impart greater confidence amongst buyers.

Board of Trade figures for the month of December serve to confirm the foregoing notes.

BOARD OF TRADE RETURNS FOR TEA FOR THE YEARS ENDING
31st DECEMBER, 1910-11-12.

Importation	Twelve Months ending 31st December.		
	1912	1911	1910
Of Indian	191,230,100	186,013,300	180,265,100
„ Ceylon	114,135,800	109,500,900	107,634,500
„ China	21,091,600	24,701,800	18,914,700
„ Java and other Countries	34,614,500	25,930,400	25,032,800
	361,072,000	346,146,400	331,847,100
<i>Home Consumption</i>			
Of Indian	165,227,300	168,744,600	162,503,600
„ Ceylon	93,486,800	89,119,500	93,370,800
„ China	10,565,500	14,495,200	10,288,200
„ Java and other Countries	25,995,900	21,142,900	20,916,300
	295,275,500	293,502,200	287,078,900

The markets re-opened on January 6th after the Christmas holidays, with a fairly good demand for Indian teas, and prices were fully steady on the values ruling previous to the vacation. Fine and finest were keenly competed for and sold readily, while good medium kinds received rather more attention and maintained their level of value; some irregularity was occasionally noted in the case of common tea, but no quotable change in prices can be recorded. A few Dooars with autumnal flavour were included in the catalogues, and prices obtained were good. On Wednesday the tone of the market was fully steady to firmer at Monday's level of value with the exception of common grades, which were easier. Fine and good liquoring teas were again in strong demand, and prices hardened, while medium kinds were in better request, and may be quoted fully steady at last prices.

Flavoury Darjeelings were wanted, and realized full rates. The Assam Company held their usual fortnightly sale of 2,419 pkgs., which realized an average of 8.69d. per lb. Among the highest averages were: Assam—Kanjikoah, 1s.; Sessa, 11½d.; Baliyan, 11d.; Itakhoolie, Budla Beta, Limbuguri, 10¾d. Darjeeling—Chamong, 1s. 1½d.; Jungpana, 11½d.; Dooteriah, 10½d. Cachar and Sylhet—Koomber, Khadim, Chargola, 7¾d. Dooars—Chalouni, Hope, 10d. The average for the whole Sale on Garden Account is 8d. per lb., compared with 8¾d. per lb. a year ago.

On the whole, good medium to fine Ceylon teas enjoyed a very good market, competition was strong, and in many cases advances were paid on last prices, while for teas that were rather inferior to previous invoices last prices were frequently forthcoming. Medium or rather low medium grades were irregular, though showing no definite change on balance. Low teas were not wanted, and were irregularly easier, buyers in the room seeming to be more or less indifferent as to what happened to them. The general result was that more lots were taken out than has been the case for some time, though a fair proportion of these were dealt in after sale. Good dusts and fannings sold at full rates, but lower kinds were rather dull. Among the highest averages were: Mount Vernon, 1s.; Brookside, 11¼d.; Eskdale and Henfold, 11d.; Radella and Kenmare, 10¾d. The average for the whole Sale on Garden Account was 8¾d. per lb., compared with 8¾d. a year ago.

Only a moderate private business is reported in Chinas, and common descriptions continue in fair demand at steady rates.

The large supply of Javas came to rather an irregular market. The best liquoring grades were in good demand, previous rates being maintained, but fair medium and common descriptions showed an easier tendency and lower quotations were recorded. Among the highest averages were: Goalpara and Tanawatte, 9½d.; Malabar, 9¼d. The average for the whole Sale on Garden Account is 7½d. per lb., compared with 8¾d. a year ago.

European Vegetables for the Tropical Planters.

To the Editor of TROPICAL LIFE.

WEST COAST OF AFRICA.

SIR,—The publicity recently given by you to my views upon the necessity of growing English vegetables for consumption by Europeans in the Tropics has caused a workable scheme to be formulated for carrying out this idea upon a profitable basis.

May I ask through your columns that any of your readers interested or willing to co-operate with me in the matter should communicate with Mr. Stuart R. Cope, 33, Great Tower Street, London, E.C., who will be pleased to send them particulars.

Yours faithfully,

ALFRED CHANDLER, F.R.H.S.

October 23rd, 1912.

Sugar.

A SLIGHT decline in prices, part of which was temporarily regained, wrote Mr. C. Czarnikow on January 9th, caused a little more activity during the week ending January 9th, and whilst we closed at 9s. 3¼d. for January and 9s. 8¼d. for May, quotations declined to 9s. 2d. and 9s. 7½d., recovering to 9s. 8¼d., closing to-day at 9s. 2d. for January, 9s. 6¼d. May, 9s. 9¼d. August, and 9s. 10d. for October-December deliveries. German factories sold rather freely, and enabled some "bears" to cover their shorts in actual merchandize. Austria, notwithstanding a large crop, sells very sparingly, if at all, and seems quite content to await further events. Hungary supplies the demand to a certain extent, but not in proportion to the size of the crop.

Refiners have bought but sparingly during the week from 9s. 3¼d. to 9s. 2½d.—the quantity offered to-day at about 9s. 3d. is not large, at the same time there is apparently no inclination to anticipate wants—which just now cannot be very pressing, to judge from the December imports of Raw Beet Sugar, which amounted to 93,000 tons.

The consumption in the U.S.A. during 1912 was 3,504,000 tons, as compared with 3,351,000 tons in 1911.

The American market has had a quiet and easier tone, under the influence of larger offerings from Cuba, where the December production is rectified at 64,000 tons, with 116 factories now working. Shipments up to January 20th sold at 2½ cents., all January 2½ cents., and February 2½ cents. The spot quotation has been reduced to 3.52 cents. = 8s. 7½d. c.i.f. for 96 per cent. polarization Javas = 7s. 4½d. f.o.b. Hamburg for 88 per cent. nett Beet. Further business in Europe has not transpired so far, though efforts to tempt buyers on this side of the Atlantic have not been wanting.

Business in Cane Sugar in the United Kingdom has been upon a moderate scale, and prices of refining grades are easier. Grocery Crystallized, at the opening auctions of the year last Friday, met a good demand, and though prices were rather irregular, on the whole steady values were realized. Low brown descriptions are less enquired for.

As regards Cane-producing countries, the West India mail reports that the drought in Demerara is now at an end, and that regular and heavy rains have fallen. In Trinidad and Barbados the weather is also more favourable. In Natal, abundant rains have fallen all along the coast, and have benefited the Canes considerably; present prospects are for an average crop next season.

The total transactions of British West India for the week amounted to about 9,700 bags. Crystallized Demerara, low middling to middling yellow and greyish, 18s. to 18s. 3d. duty paid, good middling palish and yellow, 18s. 1½d. to 18s. 9d.; good yellow and pale, 18s. 9d. to 19s. 3d.; fine yellow, 19s. 9d.; syrups, low brown, 11s. to 11s. 9d.; good greyish, 13s. 6d.; low middling to middling soft yellow, 14s. 9d. to 15s. 6d.

Good grey Mauritius Crystallized, 16s. 3d. duty paid; middling dry yellow, 17s. 9d., good yellow, 18s. 6d. Crystallized Surinam, 1,000 sold, low brownish

yellow realized 18s. duty paid, low middling yellow, 18s. 3d.; middling to good middling palish and yellow, 18s. 6d. to 18s. 9d. In the outports some business has been done in Peruvian Centrifugals and Syrups, but particulars have not been published.

Coco-nut Products, &c.

WRITING on January 11th, Messrs. Mordaunt Bros. reported that whilst Cochin Coco-nut oil was neglected Ceylon was scarce and about 6d. dearer. Prices ran as under:—

<i>Palm oil (Liverpool):</i>			1913	1912	1911
Per cwt.					
Lagos	...	...	31s. 6d.	29s. 6d.	34s. 6d. to 35s.
Benin	...	...	28s. 6d.	28s. 6d.	34s. 6d.
Congo	...	...	26s. 6d.	27s.	26s. 6d. to 26s. 9d.
Bleached	...	...	32s. 9d. to 33s. 6d.	32s. 6d.	37s. 6d. to 38s.
Clarified	...	...	29s. ,, 30s.	29s. 6d.	33s. 6d. ,, 34s.
<i>Palm kernel oil...</i>			38s. 6d. ,, 39s. 6d.	37s. to 38s.	37s. ,, 38s.
<i>Coco-nut oil:</i>					
Cochin	...	...	47s. ,, 48s.	45s. ,, 47s.	47s. ,, 48s.
Ceylon	...	...	41s. ,, 42s.	42s. ,, 44s.	41s. ,, 42s.
English pressed			37s. 3d. ,, 37s. 6d.	36s.	35s. 6d.
<i>Copra oil:</i>					
Ceylon	...	...	None	38s. to 40s.	38s. 6d.
Cochin	...	...	,,	42s. ,, 44s.	42s. to 44s.

According to the *Public Ledger* of January 11th, prices ruled as under (per ton):—

Soya Oil Beans.—Quiet. Harbin parcels spot £8 3s. 9d. Hull; November-December, £8 1s. 3d.; December-January, £8; January-February, £7 17s. 6d. Hull; cargoes, December-January, £8 2s. 6d.

Linseed Cakes.—London-made, £8 to £8 7s. 6d.

Cotton Cakes.—London-made, £5 13s. 9d. to £5 15s.

Copra.—Steady. Manila, January-March, £25 15s. sellers. Cebu, January-March, £26 17s. 6d. sellers. Java, January-March, £27 5s. done Northern Ports net. South Sea Islands, January-March, £26 15s. buyers Continent; January-March, £26 15s. sellers London. Malabar, January-March, £29 sellers. Ceylon, January-March, £28 10s. sellers Northern Ports. F.M.S. Straits, January-March, £27 18s. 9d. sellers Northern Ports. F.M. January-March, £26 15s. sellers; mixed, no Padang, January-March, £26 2s. 6d. sellers; and Macassar, January-March, £27 sellers c.f. and i., delivered weight.

Soya Oil.—London: Barrels spot London-make, £25 10s. Hull: Crushed spot, £25; extracted all positions to June, £23 5s. Oriental (in cases) afloat, £22 5s. c.i.f.; December-January, £22 5s.; January-February, £22 2s. 6d.; February-March, £22 c.i.f. Antwerp.

Coco-nut Oil.—Ceylon spot, £41; December, £41; January-February, £40 c.i.f. Cochin spot, £46; December-January, £43; January-March, £42 15s. c.i.f.

Palm Oil.—Lagos on spot, £34.

Palm Kernel Oil.—January, £38 5s.; January-April, £38 f.o.b. Hamburg.

As regards Coco-nut Oil, Messrs. Goodlake and Nutter report that Ceylon Oil is very firm, and although there is not much demand sellers are somewhat scarce. We quote December to London, 41s.; January-February, 40s. 10½d.; and January-March, 40s. 7½d. Cochin Oil: The market is very inactive for near, although there appears to have been a little

more business done for forward positions. We quote December-January, 43s.; and January-March, 42s. 9d. Palm Kernel Oil is firm, and there has been a fair demand for near positions. January there are sellers at 38s. 3d., and February-April, 38s. f.o.b. Hamburg and buyers at 2s. 6d. to 5s. per ton less. Pressed Oil is dull, and we quote 37s. 6d. January, and 37s. 3d. February-April f.a.s. London in Ceylon casks. Spot prices: Ceylon, £41; Cochin, £44 to £46.

The London Cocoa Market.

By THE EDITOR.

As I anticipated, prices have had a smart run-up over the holidays, only this was not apparent until the sales on January 7th instead of immediately after Christmas, when I thought it would come. Very little business seems to have been done during the holidays, but at the first auctions after the three weeks' break Grenadas and other W.I. went 1s. to 2s. higher, increasing in value as the competition strengthened from the middle to the end of the sales. Prices realized will be found in their usual place.

Meanwhile stocks both in London and at Havre have steadily gone back. Together they amounted to 213,710 bags in the last issue, whereas at the beginning of January, Havre had 135,829 bags (as shown), and London, on January 4th, 68,012, together 203,841 bags, or a reduction of 10,000 bags nearly between them, at a time, too, it must be remembered, when the levels should be running up, not down. The latest figures are as follows:—

Havre, December 31st—	1912. Bags.	Value. Fcs.	1911. Bags.	Value. Fcs.
Accra ...	24,990	70 to 72.50	36,802	62 to 65
Bahia ...	8,240	73 „ 82	11,112	64 „ 70
Côte-Ferme ...	19,295	86 „ 200	46,904	70 „ 200
Grenada and other W.I.	2,116	73 „ 83	2,669	65 „ 72
Haiti ...	8,651	64 „ 76	3,211	56 „ 67
Mart. and Guad. ...	2,750	98 „ 100	347	90 „ 94
Pará ...	13,577	83 „ 85	15,744	74 to 76
San Domingo ...	8,414	70 „ 75	5,274	62 „ 66
San Thomé ...	608	78 „ 79	11,009	60 „ 71
Trinidad ...	18,965	87 „ 92	33,101	72 „ 75
Guayaquil ...	26,311	78 „ 83	13,762	67 „ 75
Others ...	1,912	—	4,129	—
Totals ...	135,829 bags		184,064 bags	
		In 1911, 235,836 „		

London Stock, January 11th—	1913. Bags.	1912. Bags.
Trinidad ...	3,599	3,191
Grenada ...	2,958	8,358
Other W.I. ...	4,825	5,943
British West Africa ...	7,651	10,225
Portuguese West Africa ...	5,664	2,697
German West Africa ...	8,099	4,977
Ceylon and Java ...	11,159	9,535
Guayaquil ...	16,884	43,096
Brazil and Bahia ...	2,920	357
Other Foreign ...	7,657	8,611
Totals ...	71,416	96,990

With apologies to my old friends, M. Anthime Alleaume, of Havre, I cannot help pointing out that

whilst the business, or rather the deliveries at Havre have gone back, those for London have increased considerably for the year, showing that our capital has added to its importance as a cocoa trading centre, say:—

	1912.	1911.	1910.
Havre, delivered ...	369,343	424,329	381,730
London „ ...	211,045	157,635	150,197

We will next take the Board of Trade figures for the United Kingdom for December, and therefore for the whole of the year; unfortunately it will be noticed that far from December showing 1,200 tons increase as November did, last month showed a decrease of over 200 tons, so that instead of an increase of 2,822 as at the end of November, we finish up the end with but 2,606 tons. During December only 2,388 tons were delivered for home consumption, against 2,604 last year, and 2,689 tons in 1910, whilst the whole year's movements work out as under:—

Raw Cocoa only—	Landed.	Del'd H.C.	Exported.	Stock (Dec. 31st)
Jan.-Oct. 1910—	31,540	23,707	6,529	9,797 tons
„ „ 1911—	33,046	24,996	6,689	10,144 „
„ „ 1912—	33,702	27,602	6,155	9,498 „
	Incr. 656	Incr. 2,606	Decr. 534	Decr. 646 „

On the other hand, the deliveries and also the landings of the foreign manufactured cocoas, increased nearly 50 per cent. for the month (1,102 tons landed against 776 last year, and 1,062 delivered against 790 tons in 1911). During January-December 10,564 tons were landed, against 8,223 last year, delivered 10,677 tons, against 7,567 in 1911.

As regards supplies, the Trinidad crop and also the Grenadas are very much behind. Grenada started in proportion better than Trinidad, but her figures to the close of December show a sorrowful falling away, since only 6,273 bags were shipped between October 1st and December 23, against 16,844 in 1911, and 14,028 bags in 1910. Trinidad is no better (by the way, not a bag of this growth was landed at Havre last month; I wonder when such a thing occurred before?), her exports only amounting for the same period to 8,667 bags against 20,613 in 1911, 41,019 in 1910, and 47,683 in 1909. Both islands should turn out big supplies to the end of March, but after that the prospects are none too certain, and there seems no chance of either islands doing as well as during the previous crops, although these were by no means a record. The Guayaquil receipts for the whole year amounted to 729,300 qtls., against 804,400 qtls. in 1911, 748,400 in 1910, and 618,000 qtls. in 1909.

I am indebted to Messrs. Martin Weinstein, of Lisbon, for the following figures *re* the San Thomé output. In showing 125,330 bags landed during December, it must be remembered that, as stated on p. 240 last month, 70,000 bags of these only just missed being entered in November, and their failure to be in time caused November to have a “duck's egg” against it. As 109,500 bags were landed last year in December alone, the November-December receipts this year have been small. The receipts during the two months January and December, 1910, amounted to 212,500 bags, whilst the total with

594,597 has, so far, proved the record crop. San Thomé figures for 1912 are:—

	1912. Bags.	1911. Bags.
Landed at Lisbon, December only ...	125,330	—
Delivered „ „ „ ...	80,356	—
Stock „ December 31st ...	92,700	166,159
„ „ Havre „ „ ...	608	11,009
Total European Stock ...	93,308	177,168
San Thomé Crop—	1912. Bags.	1911. Bags.
Landed in Lisbon ...	583,010	529,382
„ „ Havre (via Madeira) ...	10,565	35,893
Total crop ...	593,575	565,275

The Bahia, January-December year, ends up very short, say 411,780 bags against 579,260 in 1911, and 400,922 bags in 1910. What I have not received are the Gold Coast shipments to end of December, even those for November have not come my way as yet.

Taking all in all, the sales of January 7th and 14th show present values to be as follows:—

Trinidads.—Fine marks, 78s.; good to fine good red, 71s. to 76s.; mid. red, 69s. to 70s. The sales on the 14th, it is claimed, showed a tendency to go 1s. lower.

Grenadas.—Good to fine, 66s. to 68s.; one lot, 68s. 6d.; common unfermented to fair fermented, 61s. to 65s. Buyers, however, are striving to get lower prices.

Dominicas.—The best marks sold at 63s. to 66s. 6d.; ordinary unfermented to fair fermented, 58s. to 62s. 6d.

St. Lucia.—Fine should be worth the same as Grenadas. Good red had 65s. 6d. bid, but were not sold.

Jamaicas touched 69s. 6d. for one mark; other good red sold at 66s. and up.; low unfermented 58s. to 59s.

British West African.—Large sales, over 20,000 bags, seem to have taken place up in Liverpool since Christmas at 54s. to 59s. In London good red, mixed with thin, sold at 59s. and 59s. 6d. Latest Liverpool news speaks of a quieter market, with sales of 5,500 bags Accra kinds at 53s. to 57s. 6d. and 59s. 3d.

Costa Rica.—Good reddish sold at 65s. to 67s.; fair, 62s.; fine bold, 88s. 6d.

Samoa have been selling at 77s. for fine, down to 74s. for good red.

Panama.—Fine bold sold at 106s. 6d.

Guayaquils.—Fair reddish Caraquez, 63s. to 64s.; good reddish Arriba, at 65s. to 65s. 6d.

Bahias.—Fully superior on January 7th were worth 69s. to 70s., judging by the c.i.f. quotations. I believe a sale has been effected at the first figure (69s.), or at least 1s. above fine Grenadas.

Cameroons were bought in at 64s. and 65s., and at the moment are valued at 63s. to 64s.

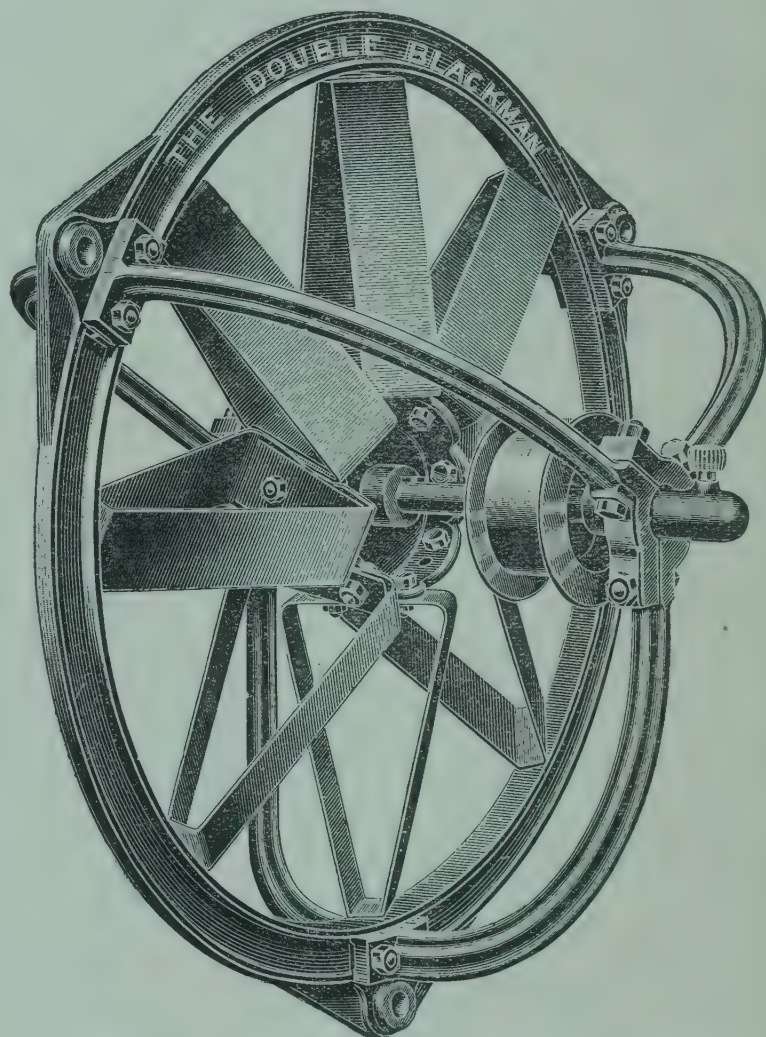
San Thomé.—I have heard of no sales, but value this growth at 62s. to 63s. Both these African kinds are momentarily selling low in comparison to Grenadas.

Ceylons.—Good bold sold at 79s. to 80s. 6d.; good medium to bold 75s. to 78s. 6d.; good native, 70s.

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Tropical Life:

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VOL. IX.—No. 2.]

FEBRUARY, 1913.

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"Coco-nuts, the Consols of the East."

WANT of space again compels us to hold over our usual column of extracts from the reviews of this book, although some of them, including those in the *India Rubber World* (New York), appeared some weeks ago.

"Funtumia Rubber and its Yield."

OWING to extreme pressure on our space, we have been compelled to hold over Part IV of this series of articles for a future issue.

"Tropical Life's" Fermentation of Cacao Book.

PUBLICATION GOING AHEAD.

REFERRING to the paragraph included in our January issue regarding the publication of the above essay, we have now to report that the book will include the following:—

(1) Dr. Axel Preyer's Essay on the Fermentation of Cacao, which appeared in *Der Tropenpflanzer* (Berlin) in 1901.

(2) Dr. Oscar Loew's Essay (published in 1907 in the Annual Report of the Porto Rico Experimental Station) on the Fermentation of Cacao and of Coffee.

(3) Dr. Fickendey's Essay on Fermentation, from *Der Tropenpflanzer* of February, 1909.

(4) Mr. Geo. S. Hudson's and Dr. Lucius Nicholls' joint Essay, published in 1911, which won the £50 prize subscribed by the readers and friends of TROPICAL LIFE.

(5) Proofs of the above have been sent to four of those named above (Dr. Axel Preyer, Dr. Loew, Dr. Nicholls, and Dr. Fickendey), as well as to other authorities on the subject, each of whom has kindly promised to write a short review or series of notes on all the essays, and bring them, so far as is possible, up to date. If this can be done, as we feel it will be, then we shall have a most valuable and unique work on the subject, one which we hope will encourage others to follow up this important matter, and carry out the experiments on a commercial scale to more final stages. Simultaneously with the English edition, we believe Messrs. J. H. de Bussy will publish one in Dutch, and the Redaction of the *Tropenpflanzer* a third edition in German, so as to enable the readers of all these languages to have the book in their own tongues, and so be enabled to study the matter first hand. Whilst the publication will be pushed forward as speedily as possible, some little delay will be unavoidable, for the various authorities have, as stated, to bring the matter up to date, and then the necessary translations have to be made and checked and the manuscript put into type and printed off.

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Drying by the Acre.—Part V.

(Or Part VII, counting February and March (1912) as Parts I and II.)

THE WOLFF SYSTEM.

WORKED either by live or exhaust steam. For tropical produce—copra, cocoa, rubber, maize, coffee, ground nuts, &c.—from 2 tons per day and upwards.

By this system the material to be dried is carried in trays on skeleton trucks, running on light steel rails through a long, low, cheaply built shed, in which the air is heated by steam pipes on the ground level. The condensed steam is automatically returned to the boiler. The temperature is lowest at the end where the trucks make their entrance through large doors. The process is thus continuous, beginning with a comparatively low temperature, which gradually increases as the line of trucks is moved forward, and as the front truck containing the fully dried material leaves the building, another is joined to the train at the cool end.

The advantage of this is obvious. By other systems the air is moved and the material remains stationary. The copra, or other product, nearest the supply of hot air gets suddenly baked, while that in the more remote positions gets only cooled and moistened air, with results easily imagined. In the Wolff system the temperature is never so high as is necessary when the air has to be introduced so heated that it will be able to traverse the drying house without becoming too cool to be serviceable at a distance from its source. The temperature can be very easily controlled, so that it need never exceed that which is best suited to the material in hand. When the quantity to be dealt with is less than the full capacity of the dryer, it is best to reduce the firing and give more time.

There is no complicated machinery to require the attendance of an engineer. A simple boiler and fixed steam pipes, with no moving parts, can be looked after by an intelligent labourer.

The trucks have roller bearings, so that a whole train of fourteen trucks can be easily moved by hand when necessary to advance them in order to take out a truck of fully dried material at one end and introduce at the other end one of fresh produce.

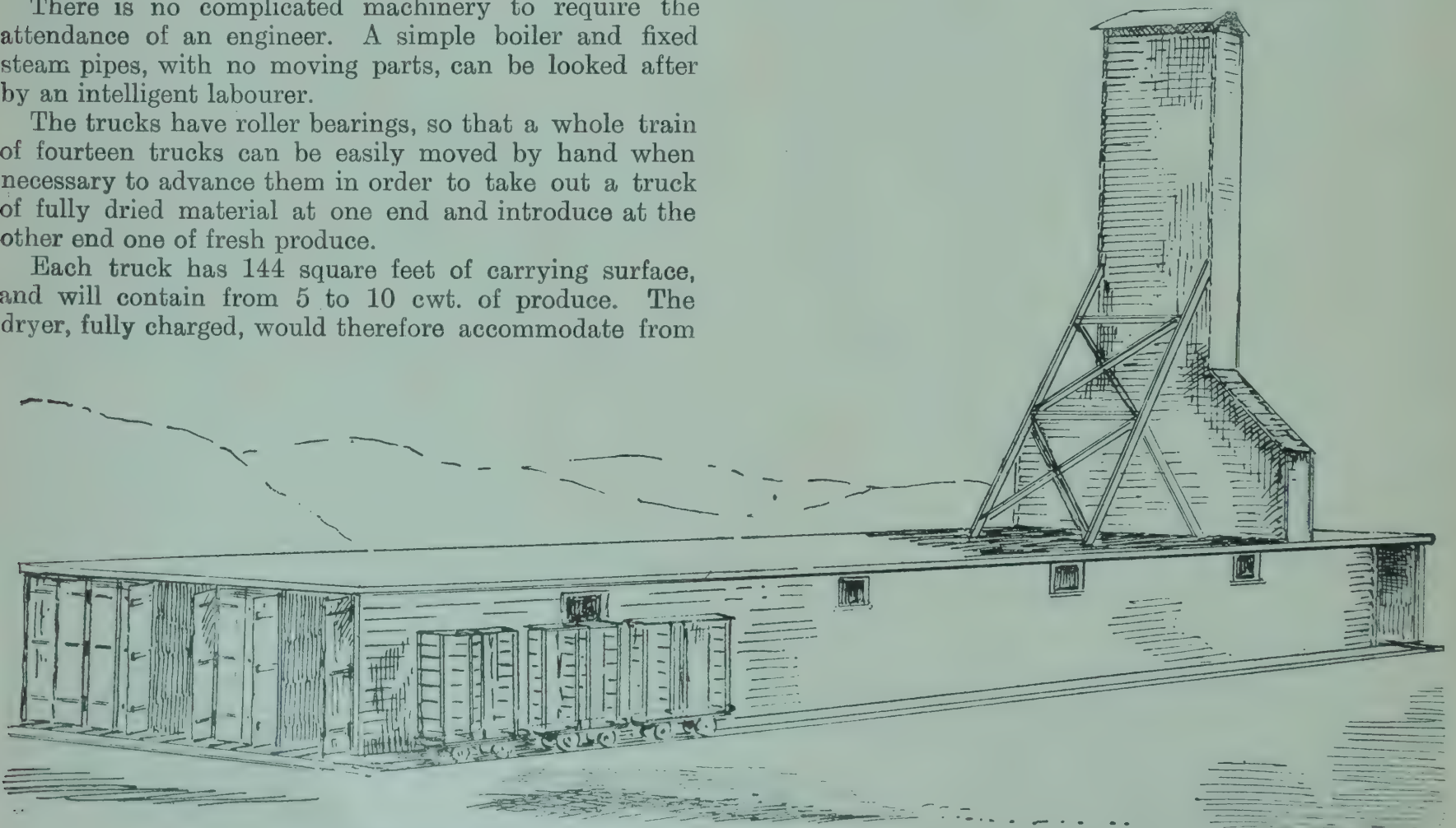
Each truck has 144 square feet of carrying surface, and will contain from 5 to 10 cwt. of produce. The dryer, fully charged, would therefore accommodate from

18 to 36 tons. Taking a safe average of 20 tons, the plant would treat 10 tons of wet produce per day, allowing two full days for the passage of each car through the building. This would require a comparatively very low temperature—a great advantage when it is necessary to avoid as far as possible all risk of loss of essential oils. Any increase in temperature would, of course, increase the output by shortening the time occupied in drying.

The building shown in the illustration is 19 ft. wide and 6 ft. 6 in. high, to take five rows of trucks; and if made 100 ft. long, to take fourteen trucks in each row, it would be large enough to turn out, easily, five tons of copra per day, and cacao, rubber, &c., in proportion. As a rule the whole capital cost of such a plant would be covered in one year by a charge of £1 per ton upon the output. This would moreover be far more than saved by the retention of the more volatile oil and the improved weight and quality of the copra or other produce.

The whole plant is supplied complete by the Wirewove Roofing Company, 108, Queen Victoria Street, London, E.C., including materials for the building and air-shaft, and a foreman to supervise and assist the installation.

MESSRS. FREDERIC C. MATHIESON AND SONS, of 16, Copthall Avenue, London, E.C., the publishers of "Rubber Facts and Fancies," recently issued two useful books, viz., "Mining Concerns; their highest and lowest prices, dividends, &c., for the past six years ending mid-December, 1912." Price, post free, 1s. 1d., and "Mathieson's Handbook for Investors for 1913," being a concise and handy record of Stock Exchange prices and dividends during the past ten years; price 2s. 6d. net. or 2s. 9d. post free. Both books will be found most handy by those interested in such investments.



A ROUGH SKETCH OF THE WOLFF DRYER, SHOWING EMPTY TRUCKS WAITING TO BE USED.

"Tropical Life" and its Work through Dutch Eyes.

By Dr. J. DEKKER, Director of the Colonial Museum, Haarlem.

"NOTES ON SOIL AND PLANT SANITATION ON CACAO AND RUBBER ESTATES."*

THIS book is doubtless an extremely remarkable publication, not only for its contents, but also for its general appearance. The personality of the writer renders the book especially interesting. Harold Hamel Smith is the well-known Editor of *TROPICAL LIFE*, who has not been in any tropical country for about ten years. The publication of the book, therefore, deserves more than passing consideration. Smith received calls and letters from hundreds of planters, and always collected the most important information gained in this way. These notes collected up to the early part of 1910 form the gist of his book. Smith submitted the views thus obtained to some (mostly English) authorities on tropical agriculture, and their opinions also are included in this book. Further, he made use of the literature which supported his views. Although in this way the personal character of the book has suffered somewhat, the views brought forward in the same carry more force. One must rather regret that more reference is not made to observations made in the Dutch colonies. Thus, the only Dutch treatise which is commented upon in detail is that written by van Hall and Drost (not Droost, as Smith writes) on the Krulloten disease of the cacao; whereas, in perusing literature on cacao, one does not like to miss the name of van Zehnter and the later investigations of the cacao experimental station at Salatiga.† Of greater value is that part in which the writer pleads for international measures to fight the spreading of plant diseases. With regard to the treatment of Hevea diseases, we are missing the name of Bernard, while in the chapter regarding extermination of rats, no reference is made to the sulphide of carbon method, which has been adopted with much success in Java. In describing the tapping of the rubber trees, the experiments carried out in Java were entirely overlooked. These various points probably, as immediately strikes the Dutchman, show that Smith has largely relied upon English advisers.

As already indicated, he made an exception with our West Indian Agricultural Department, of which another interesting proof is given by including the portraits of Messrs. Hall and Sack. Perhaps it is a former stay of the writer in the West Indies which caused this. The insertion of photos of a great number of famous tropical agriculturists must indeed be recognized as a praiseworthy idea.

The first portrait is that of Professor W. Dunstan, the Director of the Imperial Institute in London, whose pen has furnished the book with a valuable addition in the form of an introduction, in which he pleads for the establishment of good colonial agricultural colleges in the tropics—preferably at Ceylon—an idea that has also been developed in *TROPICAL LIFE*, and the adoption of which would certainly have a favourable influence on agricultural undertakings in the English colonies.

Although the matter is largely drawn from various sources, the author has left this method of work more than once by inserting forceful arguments, especially in the first chapters, dealing with the measures for fighting diseases and pests on cacao and rubber estates.

In the first chapter (based on the paper read by Smith before the Congress at Brussels) the advantage to be derived from the cultivation of different plants in the same plantation is explained. Such a measure allows the estate to be so laid out that there are no more large plantations devoted wholly to the culture of one plant. Infectious diseases could not then cause those devastations which are now observed from time to time, and are liable to occur and recur if the present method is adhered to. I would mention here that it was I (Dr. Dekker) who drew attention to the possibility of planting trees which furnish tannin in the form of belts (Tasmania, 1909). If one intends to separate the different plots by allowing the original bush to grow, then the belts must be one mile wide in order to be effective. Narrower belts may become dangerous, owing to the falling down of the larger trees on the cultivated ones. On the other hand, narrow belts do not sufficiently safeguard against the spreading of diseases and pests. The whole of the second chapter is devoted to protecting belts, which the author thinks very useful. A second useful method of fighting diseases is, according to him, a rational and sufficient manuring. The cultivated plants do not possess, as a rule, such a strong structure as the wild-growing ones of the same family, and are therefore more liable to diseases, and less able to withstand the attack of animal enemies. Everything that tends to increase the strength of the plants decrease its chance of injuries by plant and animal enemies, therefore the author thinks that rational manuring is one of the best means of maintaining the health of the trees. Special chapters are devoted to the manuring of cacao and rubber trees, and are followed up by a very detailed account in respect to green manuring.

As the removal of the stumps of the trees especially increases the cost of laying out a plantation, it is mostly delayed, and sometimes put off altogether. The author draws attention once more to the danger of such management, and describes the mechanical removal of stumps.

Regarding the treatment of diseases and pests to which the cacao tree is subject, a full account is given as to the fighting of the diseases by means of injection. Entomologists have already discovered certain viruses which kill the insects, and in the extermination of the rats this method has for a long time proved useful. In the book under review one finds in addition a suggestion that some methods used in the medical world may be adopted by plant doctors. On p. 178 an injection with fungicides is described. In my opinion such treatment can only have a useful effect. This chapter also is well worth reading.

The selection of cacao is fully dealt with, likewise the enemies of cacao; of the many authorities named, Hart and van Hall occupy the front bench, whereas the name of van Faber is missing.

The second half of the book deals with rubber cultivation. This is done in a praiseworthy manner, and embraces all that has become known during recent years regarding the cultivation of *Castilloa* (better *Castilla* D.) and of *Hevea*. The literature on the cultivation of *Hevea* shows, indeed, an increase which is almost alarming, whereas on the other hand but little useful infor-

* *TROPICAL LIFE* Publishing Department, price 11s. post free.

† That this is so was owing to our being unable to read Dutch, but there is so much to read in English, French, German and Spanish, that we may be excused if we hesitate to learn yet another language.

mation is obtainable regarding the cultivation of the other rubber plants. The handbooks up to now very seldom contain any reference to the same. That the *Manihot* can grow very quickly under favourable conditions is shown by the photo on p. 431, where a three-year-old giant is illustrated.

The method of obtaining rubber in Bolivia shows that the production of rubber may be still further improved by the adoption of more rational methods. The same labourer may in many cases obtain a ten-fold yield by employing other methods of tapping and preparing the rubber.

Another chapter shows us what a formidable competitor the wild rubber is for the plantation rubber. Owing to its better properties (less chance of spoiling and greater elasticity) is due the fact that about as much is paid for wild Pará containing 15 per cent. of water as for plantation rubber containing only 1 to 2 per cent. of water. On investigating the difference which exists between wild and plantation rubber, one finds that the former comprises all the constituents of the latex and is built up by thin concentric layers, whereas the latter is lacking in all the constituents of the latex soluble in water, and does not consist of thin concentric layers. In the so-called pressed sheets, the layers are lying flat on each other, and not in the form of an ellipsoid.

Experiments are now being tried by smoking plantation rubber by a rational coagulation, to endow it with the properties of the wild Pará rubber (see Kremer's *Hevea* culture in Leplae's article in the "*Indische Mercur*," 1911). In my opinion frequent beating, or manipulation of the rubber after coagulation should be tried in connection with the South American coagulation method, in order to retain all the constituents of the latex in the rubber. Perhaps one of the numerous geniuses at work on the matter will end by finding a method which will be workable in theory and useful in practice.

The book ends with a chapter on different tools, followed up by an index, by which the usefulness of the book is greatly enhanced.

As already mentioned, a large number of the pages are occupied by 100 illustrations and a series of portraits of persons famous in tropical agriculture. Further, the plates are so chosen that they make the contents clearer, and at the same time give the book an attractive appearance.

Without doubt one must conclude that this book well deserves the consideration of planters, especially of those who cultivate cacao or rubber. Although, without saying any more, one may not agree with all the ideas brought forward in this book, many of them are so fresh and so novel as to occupy the thoughts of the reader.

The names of the author and the writer of the introduction guarantee, moreover, the contents of the book, whilst the collaborators were also luckily selected. No better could be found in English territory.

THERE are those who say the day when we shall see the end of the smoking house on rubber estates is not far distant. According to all we can gather over here, and from what we learn of the New York rubber show, smoked rubber is sitting firmer than ever on the winner, and not likely to be unseated for a long time yet. This does not look as if the demand for smoked rubber is dying out.

Greetings from the New Hebrides.

Santo, New Hebrides, October 26th, 1912.

SIR,—Little has appeared hitherto in the columns of your valuable journal regarding the New Hebrides as a sphere for tropical enterprise, and yet, situated between degrees 12 and 20 south, with magnificent soil, and an average rainfall varying, according to locality, from 60 to 160 inches, these islands offer exceptional opportunities for development in tropical agriculture.

So far they have been scarcely touched, the total white population not exceeding 1,000. Land can be obtained in large areas at a low figure and, on the whole, I think capitalists who may be contemplating investment in tropical production could not do better than direct some attention to this little known group, while British colonists are badly needed to "leaven the lump" of the mixed element which prevails.

Up to the present, development has been confined chiefly to the planting of coco-nuts in comparatively

HOW COCO-NUT PALMS BEAR IN THE NEW HEBRIDES.



A Promising 5-year-old Coco-nut Palm at Santo, N.H.

small areas, but it has been demonstrated that cacao, coffee and cotton thrive exceptionally well.

Conditions appear to be particularly suitable for coco-nut culture, and to illustrate this I forward a photograph of a tree taken when it was five years and two months old. Since that time (some nine or ten months ago) copra to the amount of 86 lb. has been made from this one tree, notwithstanding the fact that two bunches of immature nuts were broken off during a gale. No manure has been used, and I would like to know how this compares with production in other parts of the world under similar conditions. The tree I instance is certainly above the average, but it is not exceptional; I may add that from present appearances the same tree will not yield more than 20 lb. copra for the coming year.

I am, yours truly,

A. S. THOMAS, *Hon. Secretary, N. H. Brit. Assoc.*

Modern Sundials.

FROM time to time trouble and discussions arise on estates as to how best to ensure the work being done punctually. Heat and damp are not conducive to even the best clocks going regularly and correctly, and although one gets used to makeshifts, there is no doubt that if a reliable clock or time register, unaffected either by the sun or the moisture, could be set up in a prominent centre, for all to see and work by, it certainly would be a great advantage; the only query is how can such a timepiece be arranged? We would suggest by a sundial, especially one of the latest patterns, which are very different to those of our grandfathers' days. For this reason, when in Glasgow we called on Mr. W. Homan, of 20, Renfrew Street, whom we knew had had considerable experience, in South Africa and elsewhere, in perfecting time-registering appliances, and found that the matter was not so difficult to arrange as we at first imagined. By means either of the modern concave or basin-shaped dials with a pair of cross bars, or the latest pattern with a flat brass dial, and two upright standards provided with the necessary slits, absolutely accurate time can be registered, especially in the Tropics, whilst the instruments themselves are unaffected by the weather, and so remain correct under the most trying circumstances. The same as most people, we imagined that a sundial only consisted of a flat surface, placed parallel with or at right angles to the surface of the earth, which by means of the indicator told the time of day when the sun happened to strike it, which was not always, and when a record was badly needed it was often lacking.

The new instruments can, however, always give you the time of day provided the sun is shining.

This is done by the following means in the newest kind of sundials. A dial plate, somewhat like that of a watch showing the hours and minutes, is mounted so that it can be given the proper slope to suit any locality; in the centre of the dial plate is pivoted a disc with two upright slotted brackets. To get the time all that is required is to turn the disc round until a ray of sunshine passes through the slot in one of the brackets and falls on the opposite bracket, when an arrowhead engraved on the disc will point to the correct time on the hour scale.

The larger instruments are intended to be fixed permanently outside, but the small ones can be taken indoors when not in use. This is sometimes an advantage, especially in the Tropics. These modern sundials show the same time as a watch, or, if it is preferred, they can be made to show Sun Time. A useful feature is that they can be sent by parcel post, and so can very easily be forwarded to purchasers abroad.

THE export trade in coco-nuts has been almost destroyed by a disease in Cuba, which has attacked the palms, so that the number exported has fallen in three years from 10,000,000, to 4,000,000, so reports Mr. Vice-Consul Cowan. A coco-nut oil mill at Baracoa, which formerly worked day and night, now operates only two days a week. The Commission which has been considering the disease appears to be of opinion that nothing can uproot the disease except the destruction of all the infected palms. As it takes five years for a coco-nut palm to come into bearing, the industry must for some time suffer eclipse.

Is Condensed Milk Harmful to Children?

THE *Weekly Edition of the Times* (London) for January 24th, in commenting on a report recently issued by Dr. Herbert Williams, Medical Officer of Health to the Port of London, concludes with the following sentence: "There was considerable evidence that the mortality of infants and children fed on condensed milk was much greater than of those fed on ordinary milk." It would be interesting to know how far such a comment will be confirmed or denied in the tropics, where the ordinary milk, especially as delivered to the consumers, does not always come up to the standard of the milk delivered in London.

THE current quarterly issue of the *Bulletin of the Imperial Institute* contains reports of recent investigations by the Scientific and Technical Department of the Institute, of which two are of special interest to the general reader: (1) an article on the "Cotton Industry of Nyasaland," showing its great extension in the Protectorate, and describing the evolution of a type of cotton which has now been acclimatized and is recognized as a distinct commercial variety under the name of Nyasaland Upland: and (2) an article on "Bermuda Arrowroot," which, in the laboratory tests at the Imperial Institute, has been shown to evince distinctive properties from some "Bermuda" arrowroots on the London market that are reputed to come from Bermuda. A special article, illustrated by a coloured plate, is contributed by Mr. Gerald C. Dudgeon, Director-General of the Department of Agriculture in Egypt, on the "Cotton-worm in Egypt," in which the correlation of the yield in the cotton with the degree of severity of cotton-worm attacks is examined in detail. The second part of an article on the "Coal Resources of the British Crown Colonies and Protectorates" is published; and there are other general notices respecting economic products and their development, among which is a comprehensive survey of the occurrence of bismuth ores—their distribution and utilization—throughout the world. The *Bulletin* concludes with some general notes, and with a summary of the contents of the more important papers and reports published during the preceding quarter, on subjects within its purview, and notices of recent literature.

WE have pleasure in reporting that Mr. Walter Davidson, C.M.G., Governor of Seychelles, has been appointed Governor and Commander-in-Chief of Newfoundland in succession to Sir Ralph Williams, K.C.M.G., who retired on February 1st last. As reported in *TROPICAL LIFE* for June, 1911, we entertained Mr. Davidson, Sir W. H. Lever, and a few other friends to dinner at the Liberal Colonial Club, when the Prime Minister was in the chair and took part in a discussion on the "Export of Capital." Mr. Davidson was among those who visited the London Rubber Exhibition last year.

"AMERICAN manufacturers," says the *Times of Ceylon*, "complain of the absence of uniformity in plantation rubber, thereby occasioning extra trouble and labour in the process of vulcanization. There is undoubtedly a big American future for the product, but standardization is urgently required. Smoked sheet such as Highlands and Lowlands is affording complete satisfaction."

Correspondence.

THE INTERNATIONAL DRY-FARMING CONGRESS.

To the Editor of TROPICAL LIFE.

MY DEAR SIR,—Kindly accept my apology for a belated acknowledgment of your letter of October 14th. I believe, after looking over your magazine very carefully, that we can work together for some good to the farmers in the tropical districts, in establishing a better system of tillage by which we can prevent losses from drought. I do not happen to have in hand reliable figures covering losses from drought, but from my personal knowledge, I am convinced that countless millions of dollars are lost every year in the world through careless treatment of the soil allowing evaporation to destroy the soil moisture. Take, as an illustration, the state in which we are now located—Oklahoma. In the immediate district surrounding the Convention City, Tulsa, the rainfall is 38 in. annually. Now, under ordinary conditions we would expect that 38 in. would produce regularly a very profitable crop, but on investigating evaporation we find reliable tests to prove that the actual evaporation when not reduced by artificial means is 60 in. annually. Placing the evaporation against the rainfall, there is very little left for the crop.

In Venezuela, where the rainfall ranges from 30 to 120 in., the copious rainy season packs the soil. The transition from wet to dry season and from the cool of the wet season to the excessive heat of the dry season is so rapid, and the heat so intense that ordinary tillage methods result in a total loss of moisture within a few weeks; except in seasons where occasional rains punctuate the dry season with sufficient moisture to feed the growing plant.

In Montana (one of our northern states), the annual average rainfall is something like 16 in., and yet the percentage of evaporation shows that the Montana farmer has more net moisture available than has the farmer in Oklahoma, or even in Venezuela. In the southern section of the United States, and in some of the older so-called rainbelt states, the Department of Agriculture has now begun the study of auxiliary moisture, finding that, during the growing seasons, periods of from fifteen to twenty-two days of drought are not infrequent and at a time when it is most dangerous to crops. The loss from drought, therefore, in these states is extremely heavy, and the Government has taken to teaching irrigation as a means of protecting crops at such times. The establishment of irrigation plants on a small scale for the individual farmers in the older states is somewhat expensive; and we hold that the Government is making a great mistake in not teaching the conservation of moisture by tillage methods rather than by adding moisture, which in turn must quickly evaporate under ordinary methods, demanding more moisture by artificial distribution.

I know so little about the tropical countries that I hesitate to discuss them; but I am fully aware of the fact that even in such countries as Cuba, where there is apparently an excess of rainfall, it is not unusual to meet with long periods of drought destructive to crops. I shall, therefore, be glad to have you co-operate with us in bringing to the attention of these countries the work of the International Dry-Farming Congress and the study of the methods advocated by us for the prevention

of drought, for the preservation of plant food in the soils, for the rebuilding of worn-out soils, and for a study of better business methods in the handling of farms and plantations. This organization has nothing to sell upon which it can hope for profit. Our membership is \$1.00 per year, and for that one dollar we furnish the member with a stenographic report of the International Convention, and also the monthly magazine for one year without any further cost. (The only exception to this rule is that in all countries excepting Canada, Mexico, and the United States, we must have an added twenty-five cents for postage.) We would furnish the magazine free of any charges, to all members, if we had any means of producing it; that is, were we backed by the proper financial resources. We have purchased from the publishers, with the permission of the author, a large number of Dr. Widtsoe's book, "Dry-Farming," the most extensive and complete discussion of the new soil tillage methods ever written. To members of the Congress subscribing the regular membership fee, we are sending this book at the net cost price, 85 cents. The book sells regularly at \$1.50 plus 17 cents postage. I really believe that this book, placed in the hands of your students of agriculture in your tropical countries, would be a great help.

An article from your pen, discussing losses by drought in the tropical countries, and showing the need for moisture conservation, might help us to enthuse our readers.

I should be glad if we might look forward to your personal attendance at the next Annual Convention of this organization in this city next October (October 22nd—November 1st). Our greatest work is, I believe, in educating the newspaper writers to a conception of the real need of forcefully and carefully written stuff along agricultural lines.

I am soon to have associated with me here, as the editor of our magazine, Mr. C. C. Williams, a young man who is a careful thinker, and knows his subject very thoroughly.

With kindest personal regards, I remain

Very sincerely yours,

JOHN T. BURNS,

Executive Secretary-Treasurer, International Dry-Farming Congress and Soil Products Exposition,
Tulsa, Oklahoma, U.S.A.

January 10th, 1913. ———

ONE of our subscribers who, after a long experience in tropical planting in the East, and also in the West Indies, is now visiting West Africa with a view of settling there, writes us that there is no doubt Tropical Africa, under organized and scientific white supervision, offers a vast field for agricultural and commercial enterprise; so that in the near future great wealth will be derived from those estates, now being carefully and systematically laid out under skilled white supervision, which in its turn is training up a type of native owner and manager, which will go a long way to increase the output and prosperity of "the Coast." The oil-palm (*Elæis guineensis*) lends itself admirably to cultivation, and when its improvement by selection and better cultural methods is properly understood, resulting in larger yields and returns, we shall have with palm-oil as we have with rubber the competition between the "plantation-oil" and the "wild-oil" on the various distributing markets of the world.

An Historical Medical Exhibition in London.

FOR the first time in twenty-one years the International Medical Congress will meet in London in the summer of 1913, and, in this connection, an Exhibition of rare and curious objects relating to Medicine, Chemistry, Pharmacy, and the allied sciences is being organized by Mr. Henry S. Wellcome. The response to the appeal for loans has been most successful, with the result that probably one of the most interesting collections of historical medical objects ever gathered together will be on exhibition during the meeting of the Congress.

Among other interesting sections is one including the medical deities of savage, barbaric, and other primitive peoples. Through the kindness of friends, specimens of these have been forwarded from all parts of the globe, but there are still many gaps to be filled, and those who possess such objects, and would be willing to loan them, should communicate with the Secretary of the Exhibition, whose address is given below.

Amulets, talismans, and charms connected with the art of healing will also form another prominent feature, and any loans of this description would be welcomed.

In the section of surgery, an endeavour will be made to trace the evolution and development of the chief instruments in use at the present day, and it is desired to accumulate specimens of instruments used in every part of the world by both savage and civilized peoples.

In pharmacy and in botany special exhibits are projected, which will include models of ancient pharmacies, laboratories, and curious relics of the practice of alchemy in early times. Specimens of ancient and unusual materia medica from all parts of the world will also be exhibited.

A complete, illustrated syllabus will be forwarded to anyone interested, on application to the Secretary, 54a, Wigmore Street, London, W., England.

ACCORDING to Consular Reports for 1911, cotton mills are springing up in all directions in the State of Pernambuco, Brazil, often under foreign management, with Lancashire weavers and spinners, and a large proportion of the industrial capital of the country is invested in the industry, large profits being easily earned. Excellent material is turned out, and the latest British patterns and designs carefully copied. Thanks to the prohibitive duties, nearly 75 per cent. of the commoner classes of cotton goods sold in Recife, the capital of Pernambuco, are of local manufacture.

Sugar, cotton, cotton seed, castor seed and skins continue to be the chief articles of export from the State of Alagoas. Rubber was fairly plentiful, but owing to the low prices ruling, supplies have practically stopped coming in. The cultivation of rice is pursued in the south of Alagoas, the production, however, being as yet very small. Cacao trees are being planted in increasing quantities, and there should be supplies available for export within a few years. All the cotton factories in Alagoas, of which there are five, and one in course of construction, are doing well and paying good dividends.

Rubber is the chief product exported from the State of Ceará. Official figures are, as yet, unobtainable, but it is believed that about 1,000 tons left the State during 1911.

England's Neglect of Latin America.

REFERRING to the leading article in our December issue on the indifference of all but the financial houses, to the vast possibilities of Latin-America as a trade centre, we have received the following letter from Mr. James Bryce, our Ambassador at Washington, U.S.A., on the subject:—

“British Embassy, Washington, U.S.A.

“January 6, 1913.

“MY DEAR SIR,—Thank you for the copy of your December number, which I shall read with great interest.

“I am very glad to see that you are calling attention to the importance of our people paying more attention to the possibilities of trade with South America and to endeavouring to cultivate its markets. It is a great pity that more has not been done in that direction. The first thing is that our young men should learn Spanish, and a certain number of them Portuguese also. For twenty years past, or more, I have been pointing out that Spanish should be more taught and studied by the British business world. We have done a good deal to find openings for British capital in South America, especially, of course, in the Argentine; but we are allowing ourselves to lose a good deal of commercial business to other countries, and it is quite time that our firms should bestir themselves more than they have been doing. I wish success to your efforts in that direction, and am yours very truly,

“JAMES BRYCE.

“H. H. Smith, Esq.,

TROPICAL LIFE, 112, Fenchurch Street, E.C.”

THE report presented to the shareholders of the Malacca Rubber Plantations more than confirms all we have ever urged on the advantages of thoroughly cultivating rubber, cacao, or other estates. The benefit of the energetic and thorough system of cultivation which was applied to the estates in 1910 and 1911, is now evident, the Chairman (Mr. George B. Dodwell) told those present, “and it is a matter of satisfaction to all concerned that the results have justified the great efforts and heavy expenditure which were then made. Our output of rubber for 1910 was 387,695 lb., for 1911 1,074,906 lb., and according to our present advices the yield of 1912 may exceed 2,000,000 lb., whilst for 1913 we may reasonably expect to gather in 3,000,000 lb. These splendid returns were obtained under a conservative system of tapping.” The report was carried unanimously, and a resolution increasing the capital of the Company to £1,000,000 by the creation of 600,000 new Ordinary Shares of £1 each agreed to.

Mr. Dodwell also discussed the important question of selling by public auction or private treaty. As stated in the leading article last month, we believe in both systems. By public auction you advertise your brand and establish its reputation, thereby realizing better values than for unknown brands on account of the competition between *all* buyers. Then whilst still selling a fixed percentage month by month so as to keep the mark and its value before the world, you can, when your output is very large, sell 50 per cent. to 75 per cent. privately on prices based on the values established “under the hammer.”

INDIAN TEA ASSOCIATION NOTES.

BEGINNING with this—the February issue—we have decided, after consulting with, and on the advice of, friends who occupy a leading position in the Indian Tea world, to curtail our report, and include news, other than market prices, of interest to our planting friends throughout India, among whom our circulation has considerably increased of late years. Meanwhile, we are open to receive suggestions as to how this page can be made most useful along the lines stated, and which items the planters would most like debated in our columns.

To make a start, we note that, according to Messrs. Wm. Jas. and Hy. Thompson's weekly tea circular dated February 6th, the statistical position continues to have its effect on the course of the market. Deliveries and exports in January showed a marked increase of over 3,000,000 lb., and moderate supplies from both India and Ceylon are in view. The heavy fall in prices during November found response in a smart development in trade, in which dealers largely participated, and a free business is still passing in all growths, though it is now confined chiefly to blenders. Clearances being large and stocks appreciably lower, buyers have been less hampered by financial considerations, and have entered the market with confidence.

The quality of the offerings being attractive has also imparted a more animated tone, and although offerings have been on a freer scale the demand has been active for all grades, and no quotable change in prices has taken place. Meanwhile, the following figures are of interest:—

DISTRIBUTION OF CROP FROM CALCUTTA AND CHITTAGONG TO
JANUARY 14th, 1913.

	Season 1912-1913. lb.	Season 1911-1912. lb.	Season 1910-1911. lb.
United Kingdom ...	177,976,544 ...	175,219,684 ...	163,596,960
Australian Colonies ...	8,083,363 ...	8,347,993 ...	8,649,238
America ...	7,267,114 ...	6,835,111 ...	5,124,345
Russia ...	36,375,591 ...	27,258,279 ...	36,267,139
Bombay and Persia ...	6,928,738 ...	5,398,900 ..	4,943,576
Sundry Ports... ..	5,462,110 ...	4,987,748 ...	3,847,710
Total	242,093,460 ...	228,047,715 ...	222,428,968

The position of Indian Tea generally is interesting. The figures of prospective visible supplies from Northern India continue, for the time being, to show a shrinkage, and the unexpected diversion of large quantities to foreign markets is creating here some uneasiness and anxiety for the future. This in some measure explains the present strong and active tone, but it is further stimulated by a very pronounced movement in the direction of increased consumption, the month's figures to date showing a greater increase than that of the whole of the past calendar year.

Re-exports also show a marked expansion. The balance between incomings and outgoings has taken a decided and sudden change, which, however, to some extent may be modified by somewhat larger supplies than normal from Northern India in the spring. The quality of the crop has been moderate.

Assams have shown some useful quality which has well maintained values of last season, but a large proportion of the crop has been below the average of past seasons, the liquors having been plain and the leaf in

many cases stalky, and somewhat moderate in show of tip.

Darjeelings have on the whole been rather preferable to those of last season, but stand-out invoices have been but few in number.

Dooars have been fairly useful, but barely up to the usual quality.

Cachar and Sylhets have shown fairly useful cup and the leaf generally has been well made and attractive in style.

Travancores, though hardly equal to those of the previous season, have been a fairly useful crop and some of the higher-grown teas have had attractive cup quality.

Ceylon has shown a moderate increase in yield. The effect of rubber growth is obviously telling upon many low country estates interplanted with the newer product. On the other hand, scientific manurial cultivation does not seem to have reached the limit of its results, and extensive new separate plantings in tea are rapidly approaching the stage of giving crops.

Java continues to show rapid and extensive development, and, owing to the fall in the price obtainable for the low grades, has resulted in these teas capturing from India $1\frac{1}{2}$ per cent. of the consumption of Great Britain and Ireland.

China has not maintained the increased consumption noticeable in 1911, caused by the higher price of other growths.

The Government of India has renewed the Cess Act for a further period of five years as from March 31st, 1913, which will admit of the useful continuance of the propaganda to open up new markets, and, it is hoped, encourage the drinking of tea amongst the large native population of India.

The London School of Economics advertised a course of seven lectures on the "Economics of the Tea Trade." Three of these were delivered by Mr. S. E. Chandler, D.Sc., F.L.S., on February 4th, 11th, 18th, and a fourth will be given on the 25th, on the "Cultivation and Manufacture of Tea," to be followed with three by Mr. John McEwan, J.P., F.R.Met.Soc., F.R.G.S., on "Commerce in Tea," on March 4th, 11th and 18th.

It is understood that Messrs. Schröder, Smith and Co., of Bremen, have lately despatched an agricultural chemical expert to India to study and investigate the soils under cultivation with tea, sugar-cane, tobacco, jute, &c., for the purpose of determining the adaptability of certain manures, such as potash, basic slag, nitrate of soda, and superphosphates, on the above and similar crops, and we wish them every success.

WE have received the December issue of the *Gomu Sekai*, which in English means *The Rubber World*, published at No. 190, 3 chome, Kamifukushima, Osaka, Japan, with offices also at Kobe and Tokyo. Mr. Sadao Yamada is one of the directors, having given over the editorship of the *Gomu Shimpō* to Mr. Kobayashi. The entire paper is in Japanese, but we notice some photographs of rubber-planting scenes are included, and a notice of Mr. Staines Manders about his coming book, "Who's Who in the Rubber World."

Economic Zoology.

Our Motto: "Utilization, not Extermination."

Conducted by FRANK FINN, B.A., Hon. F.Z.S.

A NEW INDUSTRY FOR SOUTH AMERICA. FARMS FOR LLAMAS, VICUNAS, ALPACAS, GUANACOS, &C.

THOSE who were interested (and we believe the number was not inconsiderable) in the suggestion we advanced last August (1912) in this section to domesticate the vicuña, or at any rate to confine the animal within restricted areas, where it would be safe from aggression, and able to breed and increase in numbers as desired, should also study the article (accompanied by a map showing the area discussed) entitled "Hunting the Guanaco," by Mr. C. W. Furlong, F.R.G.S., which appeared in the October number of "The Outing Magazine," a well-known American journal.*

When in Paris, M. Amedée Pichot accompanied our Editor when he made a tour of the Jardin d'Acclimatation, specially to show him the section devoted to the *camelidae*. This family, Mr. Furlong tells us, comprises two genera, the genus *camelus* of the Old World and the genus *llama* confined to the southern continent of the New World. Of the genus *llama*, in which we are, at present, mostly interested, there are four varieties, viz., the llama, alpaca, vicuña, and the guanaco, from all four of which wool of a long and exceedingly warm quality is obtainable. Of these the first two, *i.e.*, the llama and the alpaca, are only known in the tame state, and are evidently derived from the guanaco.

Of the warmth and comfort of garments or wraps made from the wool of these animals, everyone is agreed. Amongst the latest authorities to support this opinion is Mr. James Bryce, our Ambassador at Washington, who, in his book on "South America,"† speaks of these animals as follows (p. 81 *et seq.*): "We entered, at a height of about 11,000 feet, a region typical of the Peruvian uplands. There was plenty of coarse grass studded with *alpine* flowers, a few belonging to *European* genera. Llamas and alpacas were grazing on the slopes, herded by Indians, there were sheep and a few cattle, and in one place we caught sight, among low bushes, of a group of vicuñas. This is a creature like the llama, but smaller, and useless as a beast of burden, because untamable. It roams over the hills to a height of between 11,000 and 15,000 feet, and produces the finest of all South American wools, of a delicate, light brown tint, silky and soft as the fur of the chinchilla." Again, when describing La Paz, the capital of Bolivia, we are told (p. 178): "Within the city there is little for a visitor to do except wander through the market and buy rugs made of the deliciously soft and warm wool of the vicuña, the finest and costliest of Andean skins." Regarding the guanaco, Mr. Bryce tells us (on p. 304) that in Tierra del Fuego "but few guanacos are now left, for they have had to make way for the sheep"—this shows, however, that the animal is still at home in the extreme south, where if it could be confined sufficiently to prevent its migrating further north at certain seasons,

the colder climate would probably thicken and improve the warmth, if not the delicateness of his coat."

Once shown the way, Indians and whites alike would, we believe, be only too glad to domesticate all four members of the llama family in such districts and altitudes as suit each kind best; and instead of, as now, collecting only desultory parcels of wool, as when the hunter's energy or luck puts the animals within his reach, they would secure for themselves assured and increasing incomes. What is equally, perhaps even more important, would be the fact that the Republics in whose territories such industries were established would have their purchasing powers increased to the benefit of this and other countries, whilst a really useful family of animals would be prevented from becoming a nuisance on the one hand, as the guanacos seem likely to prove "down south," or from being hunted to extermination as the vicuñas up in Bolivia, or thereabouts, seem likely to be. We say this because since starting this article we have learnt from a paragraph in the South American supplement of the *Times*, published during the third week of January (1913), that farmers and others were complaining of the immense numbers of guanacos, estimated at 1,000,000 head, that were infesting certain districts and prayed that steps be taken to kill them off. So common have they become that their skins, which were formerly sold at 5s. each, are now only valued at 1s. 8d., and tend to go still lower. Here then is a direct confirmation of what we have just stated. Allow the nuisance to continue unabated, and the farmers will hunt the guanacos like wolves, until they are driven away or exterminated; confine them instead to certain areas where they can neither do harm, nor be harmed, and then their hides, flesh, &c., can become of great economic value. To the Onas Indians in Tierra del Fuego, Mr. Furlong tell us, the guanaco means meat for food, its warm woolly coat gives them clothing, its hides, sewn together and rubbed with ochre, serve as a wind-break, a semi-wigwam; or are sewn into small water bags, and cut into strips for cords, portage harness, and girdles. The sinews from the loins are twisted into bowstrings, and the filaments separated into threads. Even the bones they turn into primitive awls.

As it is, supplies of the wool are irregular and very small—at any rate, too small to be popular even among the wealthier classes throughout the world; this too, in spite of the fact that both the llama and the alpaca are the ancient domestic cattle of the Peruvians and Bolivians, who could breed them to any extent for their wool, as they do the alpaca, besides using them for beasts of burden, like the llama. It is known that vicuñas and alpacas can be crossed. So far as we know, the vicuña and guanaco are only met with in the wild state; judging, however, by those we saw, both vicuña and guanaco, in Paris, they can in the second or third generation, if not in the first, be tamed sufficiently to be sheared, and so avoid the wasteful slaughter that now goes on when the wool is required. Meanwhile, with judicious selection and cross-breeding an improved class of wool could probably be obtained even from the vicuña, satisfactory as we have shown that to be as it is. In any case the matter deserves attention, and we hope it will receive it. There are not many industries possible for South American Indians, but surely in guanaco, llama, or such like farms, there is the possibility of at least one.

* See also "The Pan-American Bulletin" (Washington D.C., U.S.A.) for October, 1912, p. 768.

† "South America: Observations and Impressions," by the Rt. Hon. James Bryce, O.M., &c., H.M. Minister at Washington. 611 pp., including maps and index. Macmillan & Co., London and New York. Price 8s. 6d. net.



"Tropical Life" Friend.—No. 92.

Rt. Hon. AUSTEN CHAMBERLAIN, M.P.

Chairman of the Committee to raise £100,000 for the London School of Tropical Medicine.

"OUR FRIEND" this month needs no introduction; it would be difficult indeed to gauge which of our readers could and would claim to know him best, those resident over here, or on the other side of the water. As the son of Mr. Joseph Chamberlain, as well as on account of his own striking personality as a statesman in the House of Commons, as a sturdy upholder of the Unionist cause, or, outside the House, as a leader among Imperialists, Mr. Austen Chamberlain has already made a name that will go down to posterity second only in importance to that of his father. Still comparatively a young man, there are few who would be surprised to see him, before many years have passed, as our prospective or actual Prime Minister, and it will be interesting to watch to what heights such a son of such a father will attain before he makes his last speech to the children of men.

Leaving politics, both at Westminster and from Downing Street, on one side, we mean to devote our remarks to discussing the part Mr. Austen Chamberlain is so ably playing in connection with the appeal to raise £100,000 for the extension and development of the London School of Tropical Medicine, and its life-saving and trade-promoting work in the Tropics, along the same lines as it has been steadily working during the past ten years in the West Indies, East and West Africa, the Soudan, Fiji, Ceylon, India, Bagdad, and elsewhere.

In order to drive home to our readers who have not already subscribed to the fund the moral and sentimental, as well as the practical and financial reasons that should impel them to do so as liberally as their means will allow, we invited Mr. Jack Walker to come to our assistance, and show at a glance what will happen if John Bull over here, and his relations and dependents abroad, allow tropical medical research to go slack for want of funds. Mr. Walker, we feel certain all will agree, has, in the cartoon on page 32,

depicted the situation to a nicety. The view in the background vividly recalls many a tropical up-country site, both in the present as well as in the past; the sluggish stream, the uneven ground and its endless possibilities for puddles, the shut-up store due to the mosquito getting the better of the man, and the danger of the quondam healthy Englishman in the gallery succumbing to a possible attack from the tsetse-fly or anopheline mosquito, if we revert back to the old days and ways again, all have been included and brought prominently forward; nothing has been forgotten.

It will be remembered that, at the request of Mr. Lewis Harcourt, Secretary of State for the Colonies, a Committee was formed to raise the fund we are now appealing for, and Mr. Austen Chamberlain, in accepting the Chairmanship of this Committee, has shown the utmost determination to secure the desired amount. Since the School itself was founded under the auspices of Mr. Joseph Chamberlain in 1899, when that gentleman was Colonial Secretary, to have his son as Chairman of the Committee who mean to place the School on an assured and permanent basis is most appropriate, and when one recalls the waves of enthusiasm that the name even of Chamberlain calls forth at any public meeting, at home or in the colonies, it is surely not too much to expect (if such demonstrations are genuine and not mere lip-praise, to get what they can out of these statesmen), with Chamberlain *père* as the founder, and Chamberlain *fils* as Chairman of the Committee, that the appeal now made should easily exceed the total (£100,000) asked for, especially as more than half this amount has already been subscribed. Of one thing we are certain, and that is, whatever the amount subscribed, the money will be well invested and well spent, and no one will benefit from its expenditure so much as the tropical readers of TROPICAL LIFE.

Our leading article deals with the same subject, our remarks therein being based on the paper read by Sir Ronald Ross at a meeting of the Royal Colonial Institute; over which Mr. Austen Chamberlain presided. As a result of the influential appeal for the London School that was made on this occasion by the lecturer and chairman alike, the Council of the Royal Colonial Institute have subscribed the sum of £50 to the fund, and have also opened a subscription list, in order that the Fellows and Associates of the Institute may likewise have an opportunity of responding to the appeal.

"At the request of Mr. Harcourt, the Colonial Secretary, who had hoped to be present," Mr. Chamberlain said, in his concluding remarks, "I undertook the chairmanship of this Committee. We have asked for £100,000. We have got over £50,000, so you see we are serious. You see we are doing something before we come to you, and now we ask you, in view of your work and position, to do something to help us in the task we have undertaken. It has been a pleasure for me to preside this evening. It would be a still greater pleasure if the appeal Sir Godfrey Lagden (Deputy Chairman of the Council) and his colleagues have been good enough to endorse receives a favourable response." These remarks, it is true, were directed to the Fellows of the Royal Colonial Institute, but they refer with equal force to every Englishman in the Tropics.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

FEBRUARY, 1913.

White Labour for the Tropics.

LOOKING FORWARD.—WILL TROPICAL MEDICINE GIVE US GREAT CITIES AND PROSPEROUS RURAL AREAS FOR WHITE PEOPLE IN THE FULL TROPICS BY A.D. 2000?

IN common with everyone else present at the meeting of the Royal Colonial Institute on January 14th, when Major Sir Ronald Ross, K.C.B., M.D., F.R.S., of mosquito fame, read a paper on "Medical Science in the Tropics," we came away greatly impressed with vistas of the future that the talented and yet eminently experienced and practical lecturer opened out before us regarding the possible future of the white immigrant and settler in the Tropics. The possibilities in the future development of the torrid zone or, at least, certain portions of it by white settlers, confirmed all we had hoped for, and exceeded anything we had dared hint at in our own columns.

Before discussing the actual lecture we would remind our readers of what we have often said regarding our surplus population emigrating to tropical centres, even though a considerable percentage would die before the parents became used to the life or the children had been acclimatized. Far better we contended then, as we do now, for our people, or those in America, to become agriculturists and traders in the Tropics as the Germans and Italians are doing to our disadvantage (see our December leading article, which Mr. Bryce's letter, reproduced on p. 27, confirms), than to put up with the overcrowding, underpay, and harsh conditions of life that prevail in Europe and America, or let us only say, in this instance, in London and New York. In these centres, in spite of the hundreds of millions wrung from the pockets of the taxpayers throughout the United

Kingdom and the United States, perhaps partly on account of this very taxation which makes the cost of living advance more rapidly than the wages or profits of the man-in-the-street, too large a proportion of the lowest classes, and even those who only being down in their luck should not be classed as such, seem to live like pigs, work worse than slaves, and die like rats. We have already discussed the drawbacks in England, both from the adults' and children's points of view*; this time, therefore, we will take a peep at New York. "It is no uncommon sight," said Dr. Anna Sturgis Daniel, a physician in charge of the out-patients of the New York Infirmary for Women and Children, "to see children of 4 and 5 years of age working practically all day on paper flowers. I remember one case where a child of three worked until ten at night on flowers." . . . "How do the mothers keep them at work? They beat them generally. . . otherwise they would starve." Miss Elizabeth D. Watson, an investigator for the Child Labour Commission found babies 3 and 4 years old helping to dress dolls for the Christmas trade, by turning the dresses right side out after they had been stitched." We wonder how many beatings those dolls' clothes could have told of (as the poor children's mattress did in one of Lafcadio Hearn's "Japanese Tales"), to the more fortunate ones who cuddle them, and then break them, often more quickly than the toilers make them. The New York Times reports that "a boy, only 12 years of age, was forced (more beatings one must suppose) by his parents to work from 4.30 a.m. till 10 p.m. one day (may be on others as well) and then to start again at 4.30 a.m. the next morning." These are not isolated cases, as 1,259 children worked in the canneries from 3 years old (1 child) to 14 and 16 years (317 children). The embroidery trade in New York City employs 61,000 home-workers, half of them children.†

In the face of such things, we would ask: Could such folks be worse off in the Tropics? Children of three working for a living cannot make old bones, nor healthy young ones; would they not, men, women, and children, do far better, be healthier, happier and less debased, picking coffee at Sao Paulo, cotton on estates in Queensland, or even if sent to Malaya to work like coolies and tap rubber trees? Whites must not do manual labour alongside blacks insist the superior ones who are not "in the depths;" but why listen to them when you know you are only offering the lesser, and much the lesser, of two evils?

* See for instance such articles as: "Is Europe destroying her chances of Prosperity in the Future" (December, 1912); "The Labour Market—Tropical Labour Bureaux suggested" (December, 1910); "The Conference on Emigration at the Royal Colonial Institute" (September, 1910); "Why the English do not Emigrate more" and "The Rubber Boom" (March, 1910); "Can Sugar Pay in Australia with White Labour?" (January, 1910); "The Question of Agricultural Education" and "The Home Labour Market" (October, 1909); "Labour at Home and in the Tropics" (July, 1909); "The Coming New Year" (December, 1908); "Colonial Exhibitions from the Parent's point of view" and "The Wail of the overcrowded in England" (August, 1905); and "The Emigration Question" (November, 1905).

† We are quoting *Current Opinion* of New York, for January, 1913 (p. 5). "Revelations about the Vice Trust." Reading of these and the other disclosures dispels any astonishment that in New York City alone there are 35,000 women recognized as "disorderly." We wonder how many more there are that still go wrong but in an orderly manner, probably four or five times the number.

THE LONDON SCHOOL OF TROPICAL MEDICINE FUND.

Mr. AUSTEN CHAMBERLAIN'S APPEAL for £100,000.

This Cartoon has been issued by Tropical Life (London) to illustrate, in as striking a manner as possible, the imperative necessity of supporting Mr. AUSTEN CHAMBERLAIN'S Appeal for the above Fund.



WITH THE COMPLIMENTS OF
"TROPICAL LIFE" LONDON.



YOUR MONEY OR YOUR SON'S LIFE.

Mr. AUSTEN CHAMBERLAIN, M.P. (Chairman of the Committee formed to raise **£100,000** for the London School of Tropical Medicine Fund) *loq.*—
"Come, John, you're wasting time and valuable lives. You must face facts. Either give us a little money, or your most promising sons will continue to die, and your trade will suffer—**now, then, which shall it be?**"

In the course of his lecture on "Medical Science and the Tropics," at the Royal Colonial Institute, on January 14th, Major Sir RONALD ROSS, K.C.B., M.D., F.R.S., told his audience: "Britain probably gives much less than **£50,000** per annum throughout the British Empire for Medical Research which benefits 50,000,000 white people, not to mention hundreds of millions of coloured subjects. This sum divided amongst the white subjects only amounts to **one-tenth of a Penny** each per annum. We spend every day on public banquets many times more than this sum, but if the work of investigation is to continue it must be done at once."

Would rubber estates whip children of 3, 4, and 5 years to make them work lest they starve as in New York? We know estate labour is not perfect even in English Colonies, but is it worse than the lives of some people in Europe and America?

We believe, however, if tropical medical research is supported as it deserves to be, that it will show us a way out for such folks without reducing them to the monotony of coloured estate labour. They may and can, if they have the ability, run little estates of their own after a time, and prepare the produce at a central factory, selling it in bulk on a co-operative system. When this comes about we shall be able to direct the surplus "crude labour" from this side or elsewhere, where it is starving for want of work, to the Tropics which are kept back and starving for want of workers, and this is where Sir Ronald Ross's lecture comes in. "My principal duty is to call your attention," he said, "to the immense practical importance of the recent advances in tropical medical science, not only as regards the present, but as regards the future history of the world. . . . We should particularly note that emigration took place principally into the temperate parts of the world. The principal reason why the great overflow avoided the Tropics was because the life there was a most dangerous one . . . the risks of death were really immense, but"—we are told later on, thanks to the advances made in tropical medical science—"that bar which has prevented the overflow of civilization into the Tropics will be removed. I can foresee great cities and prosperous rural areas under these benign skies which hitherto have been thought to be so deadly to life Martin Tupper wrote of Columbus that 'he gave to man the godlike gift of half a world.' Perhaps a day will come when the same thing will be said of tropical medical science."

Had we delivered this lecture we would have left out the word "perhaps," as we feel certain that the work Sir Ronald Ross has alone done has assured the settlement of white labour in the Tropics. And when one thinks of the other giants in the world of tropical medicine, of what they have done, are doing, and will do before long, then we urge that the Tropics will soon be found to be a kindlier and more gentle mother to babies of 3 to 5 years, and children above that age, than the vaunted temperate zone with its low death-rate statistics but its terribly high taxes and cost of living, which comes so heavy that we are forced to charge civilization with only keeping us from being ill, but not from misery and want when well. "The Tropics," continued the lecturer, "have a hot climate supposed to be unsuited to Europeans, but we can scarcely conceive that the extreme cold of Canada is better suited to some of the European races." Certainly after hearing Sir Ronald Ross's lecture, and reading of the exploitation of child-labour in America, we feel more convinced than ever that the transport of the surplus white labour to the Tropics, if carefully organized and protected, far from being the view of a visionary, will soon become the aim and object of every practical man to bring about.

WE wish to call attention to page xxxvi in our advertisements, by which it will be seen that we are offering Seven Gold Medals for competition at the (1914) Exhibitions.

Tea in 1912.

SCIENTIFIC MANURING PROVES ITS VALUE IN CEYLON.

ONE of the most interesting annual reports for 1912 is the one issued by Messrs. McMeekin and Co. on the World's Tea Market during last year. In this report questions affecting both production and consumption are exhaustively discussed in a way that shows an intimate knowledge of the trade. We quote the following:—"For most of the interests dependent on the Tea trade, 1910 may be held to have been a better year than 1912. The growers in every one of the great countries of production, taken in the aggregate, have had a record year for quantity, but in many cases the larger yield has been produced at the expense of quality and consequently of price. In India the average rate of yield per acre showed in 1911 a considerable increase, the figures being 504 lb., as against 466 lb. in 1910. The Assam district was responsible for the major portion of the increased crop in India (274,250,000 lb. for 1911 crop, v. 269,000,000 lb. in 1910, or 5,250,000 lb. more). In Ceylon the effect of rubber growth is obviously telling upon many low-country estates, which were entirely interplanted with the new product, and some of these must soon disappear from the producing list. On the other hand, scientific manurial cultivation does not seem to have reached the limits of its results, and extensive new separate plantings in tea are rapidly approaching the stage of growing crops."

The Little Cloud in the East.

INDIA PROTESTING AGAINST THE DRAIN ON HER LABOUR SUPPLIES.

"THERE is every probability of the tea gardens, except a few more favoured ones, being short of labourers this year, unless arrangements can be made for local labour, which in some cases is impossible (so says the *Indian Planters' Gazette*). . . . No one pretends that the conditions of labour and pay that exist in Ceylon are such as would not afford grounds for very damaging attacks by people interested in stemming the tide of immigration into Ceylon from India. . . . The drain on labour is assuming enormous proportions in other directions. The Darjeeling planters are suffering heavy losses owing to Government recruiting operations for the Arbor and Mishmi surveying expeditions. We are in full sympathy with them in their protests against the inroads that are being made. We take it that the recruiting by Assam planters would be on a small scale compared with the Government operations, drawing thousands of useful garden coolies away from Darjeeling at a time when they are most needed."

ONE of our readers abroad kindly pointed out a small error in the article we published in our October issue (p. 193) on "Sugar Cane Culture in Cuba," carried out on the lands of the Cuban Fruit and Sugar Co., when, in the table of the experiments quoted, we said in connection with plot 5 that "995 lb. of sulphate of ammonia" were used, it should have been "95 lb. of sulphate of ammonia" only.

Some Remarks on Coco-nut and Cacao Culture in Samoa.

By H. I. MOORS, Apia.

THE output of copra in Samoa has steadily risen from about 8,000 tons in 1908 to 11,000 tons in 1911, and the prospects are that within the next six years the present output will be at least doubled. As early as 1904 Ordinances were in force compelling all able-bodied natives to plant at least fifty nuts per annum, to be spaced 30 ft. apart and kept free of harmful weeds. As a result of this policy on the island of Savaii, where the regulation was more completely enforced than on Upolu, statistics show that fully 1,000,000 trees have been planted and cared for; whilst on Upolu, although possessing arable lands to offer in abundance, and with a population slightly larger than that on Savaii, it is very generally admitted that the supervision, being divided, and in many hands, has not been as effective, and the results have not proved as good. Owing to this probably not above 700,000 trees have, so far, been brought into existence on Upolu.

Of course, native owners controlled a large number of trees before the compulsory planting began at all, and it is chiefly from these that the present output of copra is gathered. Of European concerns the Deutsches Handel- und Pflanzung-Ges., of Hamburg, own and harvest crops from more than 7,000 acres of coco-nut lands, and, as they so far obtain less than 3,000 tons per annum from their properties, it will be seen that the yield per acre is somewhat under half a ton; probably it does not, as a rule, exceed $8\frac{1}{2}$ cwt. per acre.*

The statement is constantly made by thoughtless planters all over the Pacific that coco-nuts commence bearing in their fifth or sixth year and continue to do so for 100 years, reaching their maximum efficiency in their seventh or eighth year. While such conditions may exist in the Solomons, which are now being extensively planted, and where seemingly good authority backs up this claim, neither Samoa nor any other place known to the writer can show such results. Well-sprouted nuts set out in favourable situations in Samoa will show small fruits in the fifth year, but these will not develop, and even a small crop is not produced until the sixth years; whilst the tree must be at least eight years of age before it can be considered to have arrived at full maturity, and only then in the most favoured situations near the beach, exposed to the sea air, the salt water, or the underflow from the mountains passing through its roots.

In such favoured places coco-nuts may be planted rather closely, especially along the beaches, where the natives often grow them spaced less than 20 ft. apart; but it is good practice not to locate the plants less than 25 ft. distance, and many people favour 30 ft. by 30 ft. (forty-eight to the acre). On hill-sides where the trees rise tier on tier the rising rows may be closer as the branches are not liable to interlock, and thus 30 ft. by 20 ft. may answer admirably; on the other hand, hillside nuts never bear full crops.

As a rule, about 5,000 nuts are required to make up one ton of copra, or about two nuts to 1 lb. of copra.

* Half a ton of copra at three nuts to the pound = 3,360 nuts to the acre; at two and half nuts to the pound of copra = 2,800 nuts to the acre.—[Ed. T. L.]

On the Coral Islands, both north and south of Samoa, the trees never attain the same girth as they do in the volcanic islands. They take much longer to come into bearing, and in the end produce a very much smaller nut. Expensive experiments have been made, and young coco-nuts have been treated with all sorts of manures in these out-of-the-way sandy islets, where it has been found that sulphate of iron, in small quantities, applied at long intervals, gives the best results. Apparently the natives themselves in a blundering way found out that iron in some form was needed, and for a long time they have deposited about the roots of their trees old tin cans, bits of chain, wire rigging, &c., &c., and have even occasionally driven spikes into the trees, asserting that such treatment was beneficial. Unless a fair amount of rain falls with good distribution throughout the year, coco-nuts will not grow and bear on sandy exposed islands of the sea, and many such places have lately been abandoned in the Pacific as unworthy of further outlays. This experience has been expensively bought and ought not to be lost.

In prospectuses, and even in such places as Samoa, the statement is frequently made that coco-nut trees bear annually about 100 nuts each. Manifestly this is incorrect, although at any time the investigator may see from fifty to 300 nuts ripening on the trees, for it is a fact that they hang much longer than is generally believed; furthermore many trees bear very little or even not at all. Some years ago the natives of Samoa were permitted to climb their trees and throw down the nuts for copra-making, and the result was that many immature nuts were made up into a half-dried copra and sold to keenly competing traders, by whom this mess was exported, but being of such low quality it brought poor prices and aroused the suspicion of every buyer in Sydney, where the bulk of the crop was marketed.

On proper representations being made to the authorities, natives were forbidden to throw down coco-nuts under any pretence, and they were further required to carefully sun-dry their output before offering it for sale. This Ordinance has for the most part been strictly obeyed, and to-day Samoan copra is, perhaps, the best that enters the Australian markets. This result, and the great extension of the coco-nut planting industry, may be ascribed largely to the efforts of ex-Governor Wilhelm Solf, and those who advised him in Samoa.

About one-fourth of the Samoan copra crop is kiln dried, and of course this brings an especially high price owing to its cleanliness. It does not, however, contain a larger percentage of oil than the discoloured sun-dried copra does. Smoke drying is never practised in Samoa. Coco-nuts left on damp soil will sprout in a short time, and within four or six months they will throw up a shoot of from 8 in. to 16 in.; these nuts are then ready to be planted, and are almost invariably set out on their sides with the shoot standing erect. Nuts which have attained eighteen months or two years of age may, in wet weather, be transplanted, but the set-back which they get when most of their roots are cut off holds them stationary for such a long period that it is likely that the younger nut will outstrip them, and in the end prove a better tree.

The weeding of coco-nuts is, of course, a very expensive but a very necessary work in bringing forward a plantation, and while the nuts are young they have to be

attended to in this way to bring them along, and enable them to care for themselves. No plant more quickly responds to good treatment than these palms do. At first, while the shoot is small, a circle extending 2 ft. around the nut is weeded, but within a year this has extended so that no grass is within 4 ft. of the nut: and as the tree advances the circles enlarge, until in the fourth year the tree is well out of the ground, and cattle may be introduced to weed and to also manure the plantation. In Samoa it is not safe to introduce them earlier, and often not even then, for on every property, however well regulated, there will be occasionally misses, that is, places where the young trees have died, and it is necessary in such cases to get new plants in and beyond danger before animals can be put on the land. Of late years a grass which was introduced by Mrs. R. L. Stevenson, and grown at Vailima, has pretty well overrun the whole country, and is to be found in the most distant places; this often takes charge of clearings. It is desperately fought against on cacao estates, but is frequently allowed to flourish on coco-nut properties. In shaded places it provides a fairly useful grazing ground, but cattle do not readily fatten on it, and where the sun gets at this grass it is coarse and many animals refuse it. Buffalo grass is no longer planted and is only to be found in isolated places. The best fodder is the native grass known as "Vaofalli," but this will not withstand the encroachments of the stronger Vailima, or the mimosa known as the "Sensitive Plant." This latter was formerly regarded as a scourge, but is now generally considered one of the best grazing grasses in the islands. Being covered with sharp spikes it has some disadvantages, making it difficult for the labourers to get about in it wherever it is allowed to grow rankly; but if the plantations are well stocked with animals the grass is kept down, and the labourers manage to get along all right. Couch grass is also an excellent fodder, but is not strong enough to fight against other grasses and weeds.

(To be continued.)

Smoke-cured Rubber.

THE BYRNE SYSTEM.

THANKS to the courtesy of the Directors of the Rubber Curing Patents Syndicate Ltd., we have had a practical demonstration under the guidance of Mr. E. J. Byrne, of the ability of the Byrne Smoke-curing Machine, placed in one room to produce and eject into the room adjoining immense volumes of dense smoke which it is claimed will both cure and dry plantation rubber as it leaves the crêpeing machine (for we understand the rubber must be crêped, or made very thin) and turn it out by the ton of a uniform standard, quality and appearance, equal throughout to hard fine Pará from the Amazonas Valley. At the same time, we are told, the process imparts to the rubber the nerve, strength and preservative properties of the South American rival.

To achieve this object—viz., to place the virtues and advantages of the Amazon system, plus the speed necessary on the Eastern estates—at the disposal of the planters, vapours produced by the volatilization of certain products obtained by the destructive distillation of wood, are brought into contact with the strips of rubber. To produce the vapours Messrs. Byrne designed and patented

their machine, known as a volatilizing apparatus, which we saw in the first room. The patentees claim that rubber cured by them personally, on estates in the East, by means of the Byrne machine and fluid "was brought home and on being tested by a prominent firm of rubber manufacturers was described by them as being the finest plantation Pará rubber so far handled by them, and in every way satisfactory." This last sentence, placed between inverted commas, we take from the pamphlet issued by the Syndicate. It will be noted that the manufacturer did not say that the rubber was equal to hard fine in quality, which we understand is what the patentees claim for rubber cured by their process.

We can vouch that in a few minutes the machine filled the smoking-room with dense volumes of smoke; what effect the smoke would have on the rubber we cannot say as there was no rubber to be cured. A sample strip of rubber cured by the process was shown, and we must own that its colour did not attract us. It was a piece of crêpe that looked as if the excrescences on the surface had been tinged with burnt sienna, due to the colouring matter precipitated by the smoke, which stains the rubber. Where the rubber had laid over the bar, the discoloration was marked to a degree that we should say amounted to a blemish, and ought to be avoided, as it probably could be. The rubber was not transparent like Lanadron block, pale amber blanket, or Gikiyanakande worms, and we would suggest that the precipitated solids, which had stained the floor of the smoke-room, like creosoted sleepers, or the drying-floor of a cacao house, must affect the rubber, beneficially or otherwise, and it has to be seen which. As to the ability of the smoke to dry the rubber, that can only be proved by our readers on the estates. If it does, the cost is certainly not worth considering, for the apparatus is only £100, and it must cost that, but besides this those using it have to pay a royalty of 2 per cent. of the sale price of the rubber, provided such 2 per cent. does not exceed a maximum of a penny per lb. Even the full penny is not high; and as the shed needed is quite a small one, and the time said to be but a few hours before the rubber is ready for packing, so far as cost is concerned, the Byrne process, if it proves its case, will effect a great saving in all ways.

BRITISH West African cacao has been selling freely up at Liverpool. During the week ending February 8th, some 11,000 bags changed hands at 56s. to 62s., and, although buyers complained of the extreme rates, sales continued, and up to 62s. 6d. has been paid since. During the week ending August 15th another 8,800 bags were sold on the same basis, making a total sale of 20,000 bags in the fortnight. In London, sales are reported at 66s. for fine, 61s. for good reddish, and 57s. to 60s. for commoner kinds.

A LEADING authority in Papua writes us from Port Moresby that "The Government is establishing a cacao plantation of about 300 acres, and a good coco-nut plantation of 500 acres, which will be increased to 1,000 acres. There are now between 24,000 and 25,000 acres actually planted in the territory, and by the end of March (1913) it will be between 30,000 and 40,000, principally coco-nuts; 3,000 to 4,000 acres are in rubber, and 2,000 to 3,000 in Sisal hemp."

Cotton.

THE following were the prices for Cotton in London on February 6th, according to Messrs. Slann and Davies :—

	Good Fair.		Good.		Fine.		Superfine.	Good 1912.		Compare Good 1911.		per lb.
	d.	d.	d.	d.	d.	d.		d.	d.	d.	d.	
Surat kinds*	5 $\frac{7}{8}$	to 6 $\frac{1}{16}$	6 $\frac{1}{8}$	to 6 $\frac{5}{16}$	6 $\frac{3}{8}$	to 6 $\frac{5}{8}$	—	5 $\frac{3}{16}$	to 5 $\frac{3}{8}$	7 $\frac{3}{16}$	to 7 $\frac{7}{16}$	—
Madras	6 $\frac{1}{4}$	to 6 $\frac{3}{8}$	5 $\frac{3}{4}$	to 6 $\frac{5}{8}$	—	—	—	5 $\frac{1}{16}$	to 5 $\frac{5}{8}$	7 $\frac{5}{16}$	to 7 $\frac{5}{8}$	—
Bengal	—	—	5 $\frac{5}{8}$	—	5 $\frac{7}{8}$	—	6	4 $\frac{1}{16}$	—	6 $\frac{5}{16}$	—	—
Assam	—	—	5 $\frac{7}{8}$	—	6 $\frac{1}{4}$	—	6 $\frac{1}{2}$	5 $\frac{1}{4}$	—	6 $\frac{3}{4}$	—	—
China	—	—	6	—	6 $\frac{1}{4}$	—	6 $\frac{1}{2}$	5 $\frac{1}{4}$	—	6 $\frac{3}{4}$	—	—
West Indian	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8 $\frac{1}{4}$	—	8 $\frac{1}{2}$	7 $\frac{1}{4}$	—	9	—	—
Sea Island	12 $\frac{1}{2}$	—	15	—	18 $\frac{1}{2}$	—	22	13	—	16	—	—
West African	6	—	6 $\frac{5}{8}$	—	6 $\frac{3}{4}$	—	—	5 $\frac{1}{16}$	—	7 $\frac{5}{8}$	—	—
East	6 $\frac{1}{16}$	—	7 $\frac{1}{16}$	—	9 $\frac{9}{16}$	—	—	6 $\frac{3}{4}$	—	8 $\frac{3}{4}$	—	—

* Liverpool quotations.

The political position in the Near East continues to be an important factor in the Cotton market, but fluctuations have been within narrow limits this week, prices closing 4 to 2 advance for old and 5 to 5 $\frac{1}{2}$ for new crop deliveries. The Spot price is 6 points dearer, viz., 6.89d. More attention is now being drawn to reports as to preparation for the new crop. Very little business is being put through in East Indian descriptions.

The import into Liverpool this week (ending February 8th) amounts to 123,779 bales, since September 1st, 3,230,486, same week last year 101,708, last year's total 2,952 743 bales. The estimated Sales amount to 52,000 bales, including "called." Middling American is quoted at 6.89d. per lb., last year 5.85d., 1911, 7.71d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.
Brought into sight	10,842,000	11,553,000	9,602,000
Exports from United States since September 1st—			
To Great Britain	2,765,000	2,785,000	2,694,000
To Continent, &c.	3,293,000	3,681,000	2,744,000
Total crop	—	16,138,000	12,120,000

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	February 6th.	Same time 1912.	Same time 1911.
February	6.65 $\frac{1}{2}$	5 60 $\frac{1}{2}$	7.48
February—March	6.63 $\frac{1}{2}$	5.60	7.48
March—April	6.63 $\frac{1}{2}$	5.61	7.49 $\frac{1}{2}$

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

THE market was quiet during the past week (ending February 8th), and previous prices of all descriptions were not maintained. Central American kinds showed a decline of 6d. to 1s. per cwt., and Dumont Santos was only partly sold at lower rates. At the close there was rather more demand for Costa Rica, which realized generally steady prices. According to Messrs. Düüring and Zoon, the stocks in the principal ports of Europe on February 1st showed an increase for the month of 476,000 bags against an increase of 223,000 bags at the same time last year; the visible supplies on February 1st showed a decrease of 747,000 bags, against a decrease of 399,000 bags in 1912. The market for "futures" opened steady, but the close is quieter with little business doing, and values are slightly lower for the week. We quote :—

	To-day	Jan. 30th, 1913
London	Santos, Sept. del. ... 60s. 9d.	... 60s. 10 $\frac{1}{2}$ d.
New York	No. 7 Rio ,, ... 13.69 cents	... 13.72 cents
Hamburg	Santos ,, ... 67 $\frac{1}{2}$ pf.	... 68 $\frac{1}{2}$ pf.
Havre	Santos ,, ... 83 francs	... 83 $\frac{1}{2}$ francs

The receipts at Rio and Santos from July 1st, 1912, to February 5th, 1913, were 9,716,000 bags, against 10,383,000 bags and 9,428,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East African.—At 75s. for smalls, 80s. for medium, 84s. for bold.

Kilimanjaro.—At 75s. to 80s. 6d. for fine ordinary medium to bold.

Java.—At 62s. 6d. to 69s. for Robusta.

Jamaica.—At 75s. to 76s. 6d. for smalls, 79s. for second size, 81s. for bold.

Costa Rica.—At 74s. to 80s. 6d. for fair to good smalls, 78s. to 85s. for fine fine ordinary to good middling, 81s. to 90s. 6d. for fair to fine bold.

Guatemala.—At 74s. 6d. for smalls, 78s. to 79s. for low middling.

Vera Paz.—At 81s. for middling, 87s. for good bold.

Mexican.—At 79s. for low middling, 82s. for bold.

Colombian, &c.—At 76s. for smalls, 75s. to 80s. 6d. for fine ordinary to middling, 79s. to 85s. 6d. for fine ordinary to fine bold.

Dumont Santos.—Unwashed at 72s. 6d. for bold.

Sugar.

THOUGH hostilities have been resumed in Turkey, there is less fear of European complications, and the larger Cuban receipts (Willett 99,000, Himely 105,000 tons) confirmed the anticipation of a large Cuban crop, which some holders lately pretended to doubt. Thus reported Mr. C. Czarnikow on February 6th. Therefore, the slight fluctuations (May 9s. 11d. to 9s. 10d. to 9s. 10½d. to 9s. 10d.) tended rather in buyers' favour, and with more actual sugar offering, our Refiners were able to buy more liberally at the parity of about 9s. 7½d.

The unsold factory stocks in Germany on February 1st are estimated at about 400,000 tons, which mostly interests the German Refiners. The additional stocks held in refineries and private warehouses must be nearly 1,150,000 tons.

The Cuban receipts during December-January were 408,300 tons, against 262,000 tons last year, and 381,000 tons in 1910; therefore we are already 146,000 tons ahead of last year, and better yield as well as increased power is likely to make us reach the estimate if the weather holds.

The American market has been very steady in tone, and the business done has been at fully previous rates. The spot quotation remains at 3.48 cents for 96 per cent. Centrifugals = 9s. 9d. c.i.f. New York, or 10s. 3d. c.i.f. United Kingdom basis 96 per cent.

In the United Kingdom there has been a steady demand for Refining grades of Cane Sugar, but offerings are not plentiful, and where business has taken place, prices are rather in sellers' favour. In Grocery Crystallized a moderate business has been done at about steady rates.

As regards Cane-producing countries, the West Indian mail advises beneficial rains in Barbados, improving the Cane in some districts; the crop is likely to be rather late in starting, and reaping will probably not be general till the end of March. In Trinidad satisfactory rains have also fallen.

The total transactions of British West Indian for the week ending February 6th amounted to 5,500 bags. Sales included Crystallized Demerara, low greyish, at 16s. 3d. to 16s. 6d. duty paid; low middling palish, 17s.; middling yellow, 17s. 6d.; good middling yellow, 17s. 9d.; good yellow, 18s. 6d.; fine ditto, 19s. 1½d. to 19s. 6d.; Syrups, good brown, 11s. 9d.; good middling yellow, 15s. to 15s. 6d.

About 1,100 bags Crystallized Mauritius sold, low pinky grey small grain, 15s. 3d. duty paid; fine pale yellow, 19s.; and 400 bags low middling yellow Crystallized Surinam sold at 17s.; and 301 bags Syrups, brown, 11s. to 12s.; yellowish, 13s.

In Liverpool about 3,325 bags Peruvian Syrups, ordinary brown, sold at 9s. 6d. quay telquel; yellow Grocery Syrups at 12s. to 12s. 6d. quay telquel; and some 100 tons grainy, soon due, at 11s. 3d. quay, basis 96 per cent. polarization, whilst 600 tons Syrups have also changed hands at 9s. 1½d. floating, landing, Liverpool and Clyde, basis 89 per cent.

WE have much pleasure in welcoming the first number of *Kerckhove's* (monthly) *International Rubber Review*, printed in English, French and German, 20, Rue de la Ferme, Brussels. Subscription, 16s. (Fcs. 20; Mks. 16) per annum.

Coco-nut Products, &c.

At the end of last month, reported Messrs. Mordaunt Bros., the market was quiet. The little offering was well held for full values, but buyers were shy. Cochin advanced in value, but the prices asked were not realized. Ceylon is on the firm side, but America is apparently the only buyer, and transactions have been limited. We quote (February 1st): Cochin, 44s.; Ceylon, 41s. 6d. to 41s. 9d. c.i.f. terms. Pressed oil holds up well, and is now quoted 38s. 3d. f.o.b.

During the week ending February 8th there was very little going on in any position, present high figures not proving attractive. Cochin was nominally 44s. 3d., and Ceylon, although scarce, was not easily sold at the price asked, viz.: 41s. 9d. c.i.f. terms. Pressed oil was quiet, with no business reported. Prices ran as under:—

<i>Palm oil (Liverpool):</i>		1913	1912	1911
Per cwt.				
Lagos ...	...	33s.	29s. 6d. to 29s. 9d.	37s.
Benin ...	...	29s. 3d. to 29s. 6d.	28s. 6d.	34s.
Congo ...	...	26s. 6d. to 27s.	25s. 6d. to 26s.	27s. 6d.
Bleached ...	...	34s. to 35s.	32s. 6d.	38s.
Clarified ...	...	30s. to 31s.	29s.	34s. 6d.
<i>Palm kernel oil...</i>	...	39s. to 39s. 6d.	34s. 9d.	37s. to 37s. 6d.
<i>Coco-nut oil:</i>				
Cochin ...	...	47s. 6d.	48s. 6d.	45s. to 47s.
Ceylon ...	...	43s.	43s.	40s. to 41s.
English pressed	...	38s. 6d.	39s.	35s. 6d.
<i>Copra oil:</i>				
Ceylon ...	...	None	39s.	38s.
Cochin ...	...	„	41s.	42s.

According to the *Public Ledger* of February 8th, prices ruled as under (per ton):—

Soya Oil Beans firm. Parcels Harbin spot £8 12s. 6d. Hull January-February, £8 7s. 6d.; February-March, £8 7s. 6d.; March-April, £8 7s. 6d.; April-May, £8 7s. 6d. Hull.

Linseed Cakes.—London-made, £8 2s. 6d. to £8 5s.

Cotton Cakes.—London-made, £5 17s. 6d. to £6.

Copra steady. Manila, January-March, £27 value; March-May, £26 10s.; and April-June, £26 12s. 6d. Cebu, January-March, £28 sellers. Java, January-March, £28 15s. sellers; February-April, £28 1s. 3d. value; and April-June, £27 6s. 3d. Northern Ports nett. South Sea Islands, January-March, £27 15s. sellers. Continent, January-March, £27 15s. sellers London. Malabar, January-March, £29 17s. 6d. sellers. Ceylon, January-March, £29 10s. sellers Northern Ports. F.M.S. Straits, January-March, £28 17s. 6d. sellers Northern Ports. F.M. January-March, £28 5s. sellers; mixed, no Padang, January-March, £27 sellers; and Macassar, January-March, £28 5s. sellers c.f. and i., delivered weight.

Soya Oil steady. London: Barrels spot London-make, £27. Hull: Naked crushed spot, £26; extracted spot £5, forward £25. Oriental (in cases), 1,000 cases afloat sold at £25 10s. c.i.f. Antwerp; December-January, £25 10s.; January-February, £24 15s. c.i.f.; February-March, £24 5s. c.i.f. Antwerp.

Coco-nut Oil steady. Ceylon spot, £43; January-February, £41 17s. 6d. c.i.f.; February-March, £41 17s. 6d.; March-April, £41 15s.; April-May, £41 15s. c.i.f. Cochin spot, £47 10s.; February £44 10s.; February-March, £44 5s. c.i.f.

Palm Oil.—Lagos on spot, £35 10s.

Palm Kernel Oil.—February, £38 15s.; March, £38 10s.; April-June, £38 5s. f.o.b. Hamburg.

Coco-nut Yarn, Fibre, &c., sold as follows: Yarn, Fine at £23 10s. to £31; good, £20 10s. to £23; medium, £18 10s. to £20 5s.; common, £12 to £16. Roping, £10 to £17 10s.; Beypore, £15 5s. to £18. Fibre: No. 1, £30; common, £18. Rope: Coils £11 to £17 5s. subject.

As regards *Coco-nut Oil*, Messrs. Goodlake and Nutter report that Ceylon oil keeps very firm, but as far as London is concerned, the market is inactive. However, there is more inquiry from New York, and we quote January-March shipment 42s. 10½d. c.i.f. New York and London 41s. 10½d. March-April, 42s. 7½d. c.i.f. New York, and 41s. 7½d. London. *Cochin Oil* is quiet with sellers of January-March at 44s., which is much above buyers' ideas. *Palm Kernel Oil*: There is a fair inquiry, but this also mostly emanates from America. We quote February, 38s. 9d.; March, 38s. 6d.; April-June, 38s. 1½d. f.o.b. Hamburg. *Pressed Oil*: There is practically no demand except at prices which are below those asked by pressers. We quote 38s. 6d. up to April f.a.s. London in Ceylon casks. Spot prices are: *Cochin*, £45 to £47; *Ceylon*, £42 to £44.

The India-rubber Market.

IN London, during the week ending February 15th, the market for *Pará* was very quiet and prices moved in narrow limits, closing rather under those of the previous week. A moderate business was done, including *Hard Fine* closing 4s. 2½d. value, February-March delivery sold at 4s. 2¾d. to 4s. 2½d. and value, March-April at 4s. 2¾d. to 4s. 3d. to 4s. 2¾d. and sellers, and April-May at 4s. 3d. to 4s. 3¼d., closing sellers at 4s. 3d. *Soft Fine* was dull and inactive, closing 4s. 1d. value.

Negroheads dull. *Manaos Scrappy* February-March and March-April deliveries closes 3s. 1½d. value. *Cametas* quoted 2s. 3d., and *Islands* 2s. 2½d. value.

Bolivian.—Fine quoted 4s. 2½d. value.

Peruvian.—A small business was done in *Fine* at 4s. 2d. and value.

Caucho Ball dull, with sellers February-March and March-April deliveries at 3s. 2d.

Mollendo.—Fine very little offering; value 4s.

Plantation privately was quiet, but prices show only slight fluctuations, and closed much the same as on the 8th. The business included *First Latex Crêpe* on the spot, and February delivery at 4s. 2½d. and value; February-March at 4s. 2½d. and value; February-June at 4s. 2¼d. to 4s. 2½d. and value; April-June at 4s. 2¾d. to 4s. 2½d. and value; July-September at 4s. 1½d. and value; February-December closes 4s. 1½d. value, and July-December 4s. 1d.; October-December sold at 4s. 0¾d. and value. *Smoked Sheet* (ribbed) spot and February delivery sold at 4s. 4d., closing 4s. 3¾d. value; February-March sold at 4s. 4d., now 4s. 3¾d. value, and February-June at 4s. 3¾d. and value; February-December closes 4s. 3d. and value; July-December 4s. 2d.

Messrs. S. Figgis and Son report that at the auctions, on February 11th and 12th, 907 tons *Eastern Plantation* kinds were offered and met with good competition, everything being sold at about 1d. to 1½d.

per lb. below the average of the previous sale; brown and dark *Crêpes* showing the greater decline.

Meanwhile, *Hard Fine* is worth 4s. 2¾d.; *Soft Fine*, 4s. 1d.; and *Caucho Ball*, 3s. 2d. Supplies are abundant.

Prices realized at the sales ruled as follows:—

Malay (705 tons offered and sold), including *Crêpe*, fair to fine pale, dull to good palish, 4s. 1¾d. to 4s. 2¾d.; light brown and grey, part streaky, 4s. 1d. to 4s. 2½d.; fair to good clean brown, 4s. to 4s. 2d.; dark and specky brown, 3s. 9d. to 4s. 1d.; dark and black, part pressed, 3s. 9d. to 3s. 11d.; dark and black, inferior, 3s. 5¾d. to 3s. 8¼d.; dark to good smoked, 3s. 11½d. to 4s. 2¼d. Sheets, fair to very fine smoked (*Highlands*, 4s. 4¾d. to 4s. 5¼d.), 4s. 2¾d. to 4s. 4¾d.; damp, mouldy, and part smoked, 4s. 1½d. to 4s. 3d.; fair to fine unsmoked, 4s. 1½d. to 4s. 2d.; damp, mouldy, and stuck, 4s. 0¾d. to 4s. 1½d. Block, fine pale *Lanadron*, 4s. 3d. to 4s. 3¼d. Scrap and *Virgin*, fair to good, 3s. 6d. to 3s. 9½d.; mixed and inferior, 3s. to 3s. 5d. *Rambong—Crêpe*, 3s. 8½d. to 3s. 11d.; scrap and block, 4s. *Castilloa—sheet*, 3s. 9d.

Ceylon (202 tons offered and sold), including *Crêpe*, thick dull to fine, 4s. 1¾d. to 4s. 2¾d.; fair to fine pale, dull to good palish, 4s. 1¾d. to 4s. 2¾d.; light brown and grey, part streaky, 4s. 1d. to 4s. 2¼d.; fair to good clean brown, 4s. to 4s. 1½d.; dark and specky brown, 3s. 9¾d. to 4s. 1d.; dark and black, part pressed, 3s. 9d. to 3s. 11d.; dark to good smoked, 3s. 11½d. to 4s. 2d. Sheets, fair to good smoked, 4s. 3d. to 4s. 4d. Sheets and *Biscuits*, fair to good unsmoked (1 lot 4s. 3d.), 4s. 1¼d. to 4s. 2¾d.; damp, mouldy, and stuck, 4s. 0¾d. to 4s. 1¼d. Scrap and Cuttings, fair to fine, 3s. 5½d. to 3s. 8½d.; mixed and inferior, 2s. 8½d. to 3s. 4d.

Mollendo.—Unselected fine at 3s. 11d.

Mexican Plantation.—White blocked sheet, 3s. 7¾d.

Manihot.—Pressed strips, 3s. 4d.; *Lewa ball*, 2s. 8d. to 2s. 9d.

Up at *Liverpool* the *Pará* market was steady during the week, and a fair business took place. The sales totalled about 120 tons, including *hard fine* spot 4s. 3d., February, 4s. 2½d.; March-April, 4s. 2½d. to 4s. 3d.; and April-May, 4s. 3d. to 4s. 3¼d.; *soft fine*, 4s. 1d. to 4s. 1½d.; and *Caucho ball*, 3s. 1¾d. to 3s. 2½d. per lb. Medium *Brazilian* grades have been quiet, and prices unchanged. The *African* market has been easier, but a good business has been done at the decline. The sales reported amount to 70 tons, including *Assinee niggers*, 3s. 11d. to 3s. 10¾d.; small *Lahou cake*, 2s. 10½d. to 2s. 10d.; large *Lahou cake*, 2s. 6d.; *Benin lump*, 2s. 3d.; *Gold and/or Ivory Coast selected lump*, 1s. 9½d.; ditto rejections, 1s. 9½d. to 1s. 9d.; ditto *pasty rejections*, 1s. 8¾d.; and *Accra paste*, 1s. per lb.

Pará rubber statistics for the month of January (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará	...	4,020	1,110 = 5,130	agst 4,860	4,130	5,490
Shipments to Europe	1,710	750 = 2,460	„	2,340	1,400	2,090
„ America	1,790	300 = 2,090	„	1,370	1,490	2,700

Crop statistics, June 30th, 1912, to January 31st, 1913 (seven months):—

	Pará.	Caucho.	1912-13.	1911-12.	1910-11.	1909-10.	1908-9.
Pará {	1912-13	20,410	3,780	24,190	20,870	19,910	22,200
Receipts {	1911-12	18,670	2,200	24,190	20,870	19,910	22,200
„ Shipments: Europe	10,040	2,610	12,650	10,830	10,060	9,680	9,810
„ „ America	10,810	1,590	12,400	10,830	8,340	11,020	10,620

The London Cocoa Market.

By THE EDITOR.

AMERICA always was noted for the hugeness of its figures, whether in connection with private fortunes, social functions, or Government or trade finance. Now it is the "Food of the Gods" which is rapidly approaching the stage when it will also be discussed in millions, at any rate the imports and deliveries for consumption in New York will soon top seven figures at the present rate of progress. An increase of 20 per cent. on the 1910 landings caused the figures for 1911 to touch 823,500 bags, and this plus another 12½ per cent. brings us up to 928,535 bags, which is the number imported into New York City last year between January and December. Add only a 10 per cent. rise to this for 1913's increase, and we leave the 1,000,000 bags behind by 200,000 more, and it will be much the same with the consumption. Add 10 per cent. even to the figures for 1911 (816,797 bags) gives 904,050 bags for 1912, plus 10 per cent. for this year, and we shall practically have the million here also, it wanting less than 6,000 bags to complete the round figure, and that is nothing. According to Messrs. Hogins and Lee's well-known statistics on which we base the above remarks, the following were the principal growths handled:—

	Landed.		Delivered for Consumption.	
	1912.	1911.	1912.	1911.
Guayaquil ...	132,635	97,941	130,805	107,139 bags.
Trinidad ...	106,224	118,618	104,130	117,855 "
Caracas ...	74,443	94,204	75,502	89,166 "
Bahia ...	121,072	115,562	116,295	118,866 "
Sanchez ...	186,096	163,664	178,715	149,537 "
San Thomé ...	169,690	108,135	168,130	113,689 "
Other African ...	44,313	38,331	44,060	37,986 "
All kinds ...	928,535	823,436	904,050	816,797 "

Coming now to productive areas I am wondering if before we go to press the January-December figures for our Gold Coast Colony will come to hand and so enable me to include them this month. In case they do not, I will give those to the end of November, which show that if 1912 is to equal the output of 1911, much more to exceed it, as it ought to do, the receipts during December should amount to 22,000,000 lb. or more. I believe the beans are there, and that if the shipments last year have not exceeded those of 1911, it is because, with the rush at the end of the year, they were unable to get the cocoa down to the coast. Here are the figures, which I owe to the *Liverpool Chamber of Commerce Journal*:—

Gold Coast Output—		1912.	1911.
		lb.	lb.
January—September	...	47,588,446	44,191,722
October	...	4,444,353	7,585,533
November	...	15,343,057	18,814,222
December	...	*22,000,000	18,890,749
Comparative Totals	...	89,375,856	89,482,226

* Estimated to make the 1912 output equal that of 1911.

Going elsewhere, I can report that the January-December output of Trinidad (W.I.) works out in lb. as follows: 1912, 41,372,400 lb.; 1911, 45,437,400 lb.; 1910, 58,018,058 lb.; 1909, 51,259,725 lb. The present crop at this fluctuating centre is still very late, and the last mail brought the news that the excessive wet that has taken the place of the drought, whilst possibly benefiting the growth and vegetation, was retarding

the picking and preventing the drying and curing of the cocoa altogether at times. The shipments from October 1st to January 18th show how behind the shipments are, the totals working out at 26,733 bags, against 55,983 in 1911-12, 66,991 in 1910-11, and 84,173 bags in 1909-10. To show how small the sixteen weeks' shipments have been this crop since October 1st, it should be remembered that during the fortnight ending January 18th last year 25,014 bags were exported, or only 1,700 bags less than the exports during the sixteen weeks under review of the present crop. Reports from the island speak of heavy pickings for February and March, but they will have to be "real substantial" to equal even last year's, which were not a record export, and so in equalling them the shipments would not be very surprising. Last year Trinidad shipped 151,000 bags to March 30th (from October 1st) against 134,795 in 1910-11, 160,083 in 1909-10, and 170,994 bags in 1908-1909. For this crop, therefore, to come up to last year, which is below the average of the four years, Trinidad will have to export 124,000 bags by March 30th, or an average of 25,000 bags every fortnight. I fear this will not be done, and, although the weather of late may prove beneficial for the after-March pickings, it looks very much as though Trinidad will again prove disappointing with its 1912-13 crop, although the 1911-12 output was behind, causing two short crops to come together. I reckon that with the area now under full-bearing trees, an output of 300,000 bags a year from Trinidad would only be a fair crop, whereas the last four crops have only amounted to 221,606 bags for 1911-12, 251,894 for 1910-11, 293,886 for 1909-10 (the record), and 267,214 bags for 1908-9. The present rate of output for so old-established a centre must therefore be reckoned as very poor, and will ever be so until the planters become more up-to-date and take better care of their trees and estates, as their Agricultural Department are always at them to do.

San Thomé also has started the year with a short delivery, only landing 33,000 bags at Lisbon, against 78,000 last year, 57,635 in 1911, and 103,175 bags in 1910. The stock at Lisbon on January 31st was only 73,725 bags, against 212,836 bags last year. This reduced stock, the smaller output from the Gold Coast, the extreme lateness of the Trinidad crop, and also of Grenada, the restricted output from Bahia, all naturally tend to make supplies short and reduce stocks, just when they should be very full, with the natural result prices are higher, and will remain so until visible supplies are larger, and likely to remain so. The London stock on February 8th was 40,000 bags less than last year, as under, and the stock at Havre is nearly 50,000 bags behind. Here are the latest figures for both these centres:—

London Stock, February 8th—		1913.	1912.
		Bags.	Bags.
Trinidad ...	...	2,821	4,915
Grenada ...	...	2,822	11,536
Other W.I. ...	...	4,651	7,184
British Africa ...	...	7,682	12,756
Portuguese Africa...	...	5,031	6,288
German Africa ...	...	7,402	5,098
Ceylon and Java ...	...	12,182	9,057
Guayaquil ...	...	15,278	45,040
Brazil and Bahia ...	...	2,959	1,167
Other Foreign ...	...	7,980	7,827
Totals ...	...	68,808	110,868
On February 15th ...	...	68,735	108,060

Owing to the heavy arrivals of Accra kinds at Havre, the stock at this French port on January 31st had been increased just the 20,000 bags by which the receipts of this West African growth exceeded the deliveries during January, say, 24,736 bags landed, against 4,477 delivered, the full figures of the stock working out as follows:—

	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
<i>Havre Stock, January 31st—</i>				
Accra	45,249	73 to 76	57,016	62 to 66
Bahia	12,728	78 „ 85	14,881	65 „ 71
Venezuela	16,041	86 „ 200	46,011	70 „ 200
Grenada and other W.I.	2,893	78 „ 85	4,612	64 „ 72
Haiti	7,393	65 „ 79	5,020	55 „ 68
Mart. and Guad. ...	3,796	—	—	—
Pará	13,006	83 „ 86	13,068	75 to 78
San Domingo	9,409	72 „ 76	4,598	63 „ 67
San Thomé	1,289	81 „ 84	11,323	69 „ 71
Trinidad	17,311	84 „ 88	28,689	71 „ 75
Guayaquil	23,927	78 „ 85	12,614	68 „ 75
Divers	2,243	—	5,223	—

Totals ... 155,285 bags 203,055 bags

The following figures of deliveries for consumption have come to hand:—

	1912. Tons.	1911. Tons.	1910. Tons.	1909. Tons.
<i>Delivered for Consumption—</i>				
New York—Jan.-Dec. ...	63,678	58,048	49,340	49,524
Germany— „ ...	54,217	50,054	43,250	40,725
U.K.— „ ...	27,602	24,996	23,707	23,883
France— „ ...	26,493	26,927	24,697	22,910
Holland— „ ...	24,528	23,165	19,187	19,387
Belgium— „ ...	6,500*	5,500	4,792	5,010

Total ... 203,018 ... 188,690 ... 164,973 ... 161,439
* estimated.

Including the sales of February 18th, present values (based on actual sales) work out as follows:—

Trinidads.—Good to fine good red marks are selling at 76s. to 78s., fine 79s. and 80s., whilst good mid. red is valued at 72s. to 75s., and superior up to 85s. (nominal).

Grenadas.—Fine touched 71s. at the sales on February 18th; good marks 68s. to 70s.; common unfermented to fair fermented, 62s. to 66s.

Dominicas sold up to 68s. and 68s. 6d. for fine marks, and down to 60s. to 64s. for unfermented to fair reddish.

St. Lucia.—Fine realized 68s. 6d.; common unfermented are worth 58s. to 60s.; good fair, 64s.

Jamaicas.—Good red marks sold at 64s. to 65s. 6d., fine washed realized 70s., and low unfermented to fair reddish at 59s. to 62s.

Costa Rica.—Good reddish sold on 11th at 70s. to 72s. for fine against 66s. 6d. for good red on February 4th, and fair at 64s.

Guayaquils.—Good sales privately are reported, including Arriba at 69s. to 72s., Balao and Tenguel at 68s. to 70s., Caraquez and Machala 65s. to 67s. 6d.

Bahia.—Fine superior has been sold at 71s.; but seems to be still below the parity of values on the other side, and present values are above this.

East African.—Fine medium realized 75s. 6d., good bold 77s. 6d.

Cameroons were selling rather low in comparison to Grenadas, but last sold at 64s. 6d. to 67s.

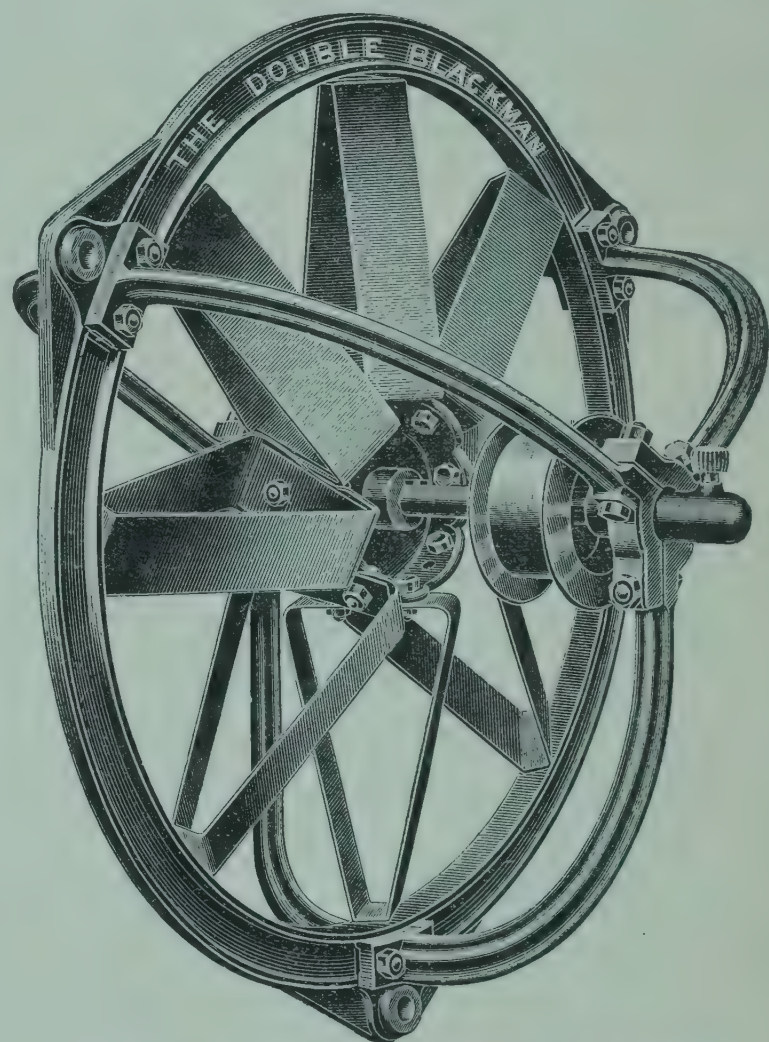
San Thomé sold at 63s. 6d. to 65s.

Ceylons.—Good boldish has been selling at higher rates, say, fine bold 83s. to 90s., good bold at 80s. to 82s.; fair to good medium and bold, 76s. to 79s.; good to fine native sold at 67s. to 77s.

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Further Press Comments on Our Book, "Coco-nuts, the Consols of the East."*

The India-Rubber World, New York.—"The work will be found indispensable by planters."

The Philippine Agricultural Review.—"The volume contains 500 pages of very interesting matter, on all branches of the subject, from selection of the seed to handling the finished products."

Samoansche Zeitung.—"The book is useful even to the man who thinks he knows the coco-nut tree from root to crown."

Capital, Calcutta.—"The authors give a note of warning against exaggerated yields. While there is nothing to discourage *bonâ fide* planting, there is no encouragement of wild schemes."

United Empire, London.—"This excellent and practical manual is specially welcome at the present time, when so much attention is being directed to the cultivation of the coco-nut."

The Times, London.—"In view of the warning just issued by the Government of the F.M.S. against rash propositions, it is interesting to note that the authors warn their readers against exaggerated reports."

Tropical Life's Book on the Fermentation of Cacao.

SECTIONS ON THE FERMENTATION OF TEA, COFFEE, AND
INDIGO AND TOBACCO TO BE ADDED.

In our last issue we reported that the above book would include essays by (1) Dr. Axel Preyer; (2) Dr. Oscar Loew; (3) Dr. Fickendey; (4) Mr. Geo. S. Hudson and Dr. Lucius Nicholls. To the above we have, thanks to a suggestion of Dr. Matthiesen, editor of our contemporary, *Der Tropenpflanzer*, been able to add an article by Dr. Schulte im Hofe, in which the fermentation of tea, tobacco, indigo, and coffee is also freely discussed and compared with that of cacao. Planters, therefore, of all these products will be interested in this book, and our best thanks are due to Dr. Schulte, as to others, for his help and for allowing us to include so important an addition to the other opinions on the subject.

Submitting a proof to Dr. Fickendey on the West Coast of Africa will delay us a little, but not much. The translation of such articles being technical as well as scientific, it is necessary to take time in checking the proofs so that the opinion of each authority is translated correctly.

The date of publication, the size and cost of the book, are still open questions; but we will publish full particulars as soon as we get back all the proofs.

* TROPICAL LIFE Publishing Department. Price 11s., post free.

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Drying by the Acre.—Part VI.

THE "SHAW" SYSTEMS FOR RUBBER, BANANAS,
COPRA, &c.

By J. DARNLEY TAYLOR.

AS predicted in a letter I wrote you about three years ago (see TROPICAL LIFE, April, 1910, p. 75), the managers of Rubber Estates have been obliged to seriously consider the question of drying. They now find they cannot conveniently deal with the present large outputs in ordinary drying sheds. It takes such a long time for the rubber to dry in them, and the sheds are required to be of such enormous size that they have become unwieldy and almost unmanageable. To such estate owners and managers I would like to suggest the use of the "vacuum dryer" as made by Francis Shaw and Co., Ltd., of Manchester, who are manufacturers of rubber machinery, and specialize in vacuum drying installations. I have had some experience with these and can recommend them. It appears to me as being the only feasible method they can adopt, as when taking into consideration the humidity of the atmosphere which prevails in all rubber producing districts, it is necessary to use a drying machine which does not admit this humid atmosphere.

It is a system which was introduced for drying rubber some six or seven years ago. Many estate managers at that time adopted it, but some, I understand, abandoned it in favour of the "air-drying shed." They complained that the vacuum method had the effect of spoiling the rubber, inasmuch as it became "nerveless" and "tacky" during treatment. Others who adopted it about the same time probably experienced the same trouble, but appreciating the cause, they remedied the defects, and from that day to this they have used the vacuum system with absolute success, producing rubber which always fetches the highest prices at the fortnightly public auctions.

This, then, should be sufficient proof of the utility of this system. The defects I speak of above are neither mechanical nor caused by badly constructed plants, as the latter are built exceedingly well and work automatically, or as near to it as it is possible to obtain. The main cause of the trouble mentioned above is probably explained by the fact that the man in attendance on the dryer did not understand what to do. Possibly he did not know how to put the rubber in the stove and when to take it out, or what temperature and vacuum to apply. I believe that if these points were thoroughly understood by the operator, this method of drying rubber and other tropical products would be universally adopted. For the benefit of your readers I will endeavour to explain how I consider this system should be worked in connection with rubber.

After the rubber is taken from the crêpeing or sheeting machine it should be laid on wire netting trays, and then placed on the shelves in the stove; the bottom of the tray should not be in actual contact with the shelf, but elevated about $\frac{1}{8}$ in. from it. When the stove is fully charged, the door is closed and the vacuum pump started, this latter should not then be stopped until the drying operation is completed. A vacuum of between 27 in. and 28½ in. should be attained and maintained all the time.

As soon as the pump has been started water, which has previously been heated to boiling point, or, if desired, steam at not more than 4 or 5 lb. pressure, is allowed to pass continually through the shelves. The moisture will immediately begin to free itself from the rubber, and pass through a condenser to a catch pot or receiver. If the plant is allowed to run on like this, the rubber will be freed of its moisture to within about 1 per cent. in from one and a half to four hours, according to the thickness of the crêpe or sheet.

Every installation should be provided with a tell-tale thermometer, as this will show a rapid rise in temperature immediately the rubber is freed of the bulk of its moisture. Now, if the attendant will take this as the indicator when to stop the drying operation, excellent results will be obtained. It will be found that the rubber has been dried in perfect uniformity at a temperature not exceeding 95° F.

Care must be exercised at the time the rubber is taken from the stove, unless it is to be made into "block," as it is then still warm and will absorb a small percentage of moisture from the atmosphere unless placed in a dry cooling cupboard.

If the rubber is allowed to remain in the stove subjected to the heat of the shelves after the moisture has been extracted, the inevitable result will be nerveless and tacky rubber.

I shall be pleased to go into details regarding the above system, if your readers will write to me at 139, Cannon Street, London, E.C.

Explosives and Other Things.

Our thanks are due to the Nobel's Explosives Co., Ltd., for their useful blotter and diary combined. Those fortunate enough to possess one will find it extremely useful. Acknowledging this welcome present reminds us that the *Indian Planters' Gazette*, and also *Capital*, have been ably supporting our campaign to explain the advantages of using explosives for agricultural purposes throughout India. Signor Urgo Rossi, of the International Agricultural Institute of Rome, is also following up the subject closely, and has written for copies of our articles, and any further literature we have on the subject, all of which we have had much pleasure in sending him. The January issue of the *India-Rubber World* of New York contains, on page 190, a detailed abstract of our paper on the subject contributed to the Rubber Congress, held last year in New York, and the Journal states that the entire paper will be published as soon as possible. Mr. Hy. C. Pearson is at present travelling through South America, but as soon as he returns to New York a decision will be arrived at as to whether or not all the papers submitted to the Congress will be published in book form. We for one hope they will, so does everyone we have asked. To keep at least a score of copies of *India-Rubber World* at your elbow, instead of having a neat book to refer to, when you want to look up what Mr. Baxendale, Dr. Huber, or others of authority have to say, would entail so much trouble that we are sure Mr. Pearson, both to save our time and our souls, will vote solid to have the lectures put up in book form, and the sooner this is done the better.

"Tropical Life" and its Work through Dutch Eyes.

By Dr. J. DEKKER, Director of the Colonial Museum, Haarlem.

THE CULT OF THE COCO-NUT.

ABOUT a year ago the undersigned (Dr. Dekker), Director of the Colonial Museum, Haarlem, Holland, had the pleasure of reviewing in the *Indische Mercur*, Hamel Smith's "Notes on Soil and Plant Sanitation on Cocoa and Rubber Estates," a book containing much useful knowledge. The preface was written by Professor Dunstan, the Director of the Imperial Institute, who took the occasion to recommend the founding of a tropical agricultural school in Ceylon as an appropriate tribute to the memory of King Edward VII. The same subject is discussed at length by Smith in his Introduction to "Coco-nuts, the Consols of the East," a new work on coco-nut cultivation which he has written this time in conjunction with Mr. F. A. G. Pape, who has contributed numerous illustrations and some original sketches, while the preface has been written by Sir W. H. Lever.

In various numbers of TROPICAL LIFE, Smith gives repeated evidence of his great partiality for the cultivation of the coco-nut, so that we are not surprised to find his name on the title-page of a book on its cultivation as a staple product.

In another ten years' time, says Smith, it will be an utter impossibility for anyone to succeed at tropical agriculture except those who have been previously trained from early boyhood, as is already customary for the youth who proposes devoting himself to the career of the Army, Navy, Church, or Law. He sets forth the various reasons why it is so essential that British lads should first receive a proper training before venturing to experiment upon tropical agriculture. In the preface, Sir W. H. Lever states that the "cultivation of the coco-nut is an excellent means towards the attainment of independence by young planters." To this end he proposes that the Government or public institutions should lend their support after the manner in which Canada gives first assistance to her farming settlers. One or two hundred acres of coco-nut plantation will nett the planter a yearly income of £2,000, consequently he is well able to pay a reasonable rate of interest for capital lent to him; whilst Smith sees in the coco-nut palm a plant which deserves to take a foremost rank in all tropical regions suitable to its growth.

The book has all the characteristics of a key to the cultivation of the coco-nut, and thus displays a greater degree of unity than the book on "Soil and Plant Sanitation." With the exception of the preface by Sir W. H. Lever, and a paper by Barrett on the "Amelioration of the Soil," the co-authors take all responsibility for the contents upon themselves. In the introductory part, which comprises 58 pages, Pape utters some useful warnings to prospective immigrants, such as "not burdening themselves with too expensive an outfit, never to omit to boil the drinking water, and to keep the mosquito well outside the dwelling." These are all salutary pieces of advice which cannot be repeated too often.

Proceeding to the book itself, I will begin by giving a warm welcome to this new addition to coco-nut literature. With Prudhomme's "Cocotier" and Preuss's

"Kokospalm," we still need a third to make the "Alliance" complete. We frankly admit that the place is worthily filled, the work being a very store of British experiences and British literature. After some thirty pages or so on upon the subject of establishment, of laying out estates, and the selection of sites, the writers discourse upon the cultivation of the coco-nut in various localities, strange to relate, however, making no mention of our Colonies whatever. Had the authors consulted the Coco-nut Bulletin of the Colonial Museum, this would probably have not been the case, whereas other than English literature is only exceptionally mentioned. Meanwhile about 130 pages are engrossed by these descriptions, which constitute one of the most attractive parts of the book. Then follows a detailed description of the cultivation of the coco-nut, which is described in full, in a clear and pleasant manner. From the choice of the seed and the keeping of the nursery beds, down to the expression of the oil and the handling of the copra, everything is narrated in the same simple style. The writers go very closely into explanations where they discuss diseases and pests, particularly the former. One of my friends in India would have laid more stress upon the pests and started a war against rats and beetles. In his opinion the "Bouillie Bordelaise" (Bordeaux Mixture) comes second in India.

The matter of manuring has been most carefully studied. The chapter on "Manuring" contains the best illustration in the entire book, *i.e.*, a coloured picture illustrating nuts from fertilized and non-fertilized palms. Barratt makes a remarkable statement in reference to the fertilization of the soil by natural means. In a drastic manner he depicts the enormous losses the community entail through the lack of intensive cultivation of the soil by agriculturists. According to him they represent no less than £800,000,000 sterling. It is obvious that in England one needs big figures and weighty words to create an impression. The chapter on the "Keeping of Cattle," more especially pigs, in relation to the cultivation of the coco-nut, contains many a wise remark.

Finally, the preparation of copra, the extraction of coco-nut oil, the distillation of alcohol from the juice of the flowering spathe, and the extraction of the fibre, are all accurately described and supplemented by illustrated sketches. The sketches of Pape give interesting glimpses of the usage of the parts of the coco-nut palm in the homes and surroundings of the different inhabitants of the Tropics.

The index is most conveniently arranged, while the synopsis, which covers over twenty pages, is also most carefully drawn up, and in so concise a form that we give it special comment. Summing up, it is evident that the literature upon the subject of Coco-nuts has been enriched by a well-written book in concise form.

THERE was less demand than had been anticipated at the Dutch Bark Sales in February, and less than half the quantity offered was sold, the average unit being quoted 4.31 cents, against 4.25 cents at the previous sale, and 3.07 cents in February, 1912.

In London the demand was slow, but holders being firm only a small proportion sold. The unit was quoted at $\frac{1}{16}$ d. per lb. against $\frac{1}{8}$ d. in January, and $\frac{9}{16}$ d. in February, 1912.

The Fertilization of Tropical Crops.

IT is probably not realized, even by those who are directly concerned, how little real attention is devoted to this all-important question.

In temperate climes the interest taken in the subject is increasing by leaps and bounds as the ever-growing demand for food-stuffs makes it imperative that the soil should be made to produce to its utmost capacity.

The day is past, even in America, when the cultivator can move on to fresh fields, after exhausting the natural fertility of the soil by continuous cropping without replacing the plant foods which have been removed. To anyone who cares to study the question it will be evident that the future supply of food for the world's consumption will soon become a pressing one, as population increases and new fields for cultivation become fewer and fewer.

In tropical countries, with a few exceptions such as Java, Ceylon, and Hawaii, the importance of getting the maximum yield from the soil does not seem to be realized, or, if it is, little attempt is made towards accomplishing it. It is almost impossible to calculate the annual loss to the cultivator, and therefore to the whole community, which arises from either ignorance of fertilizing methods or careless disregard of them.

Take the case of India, or of Mexico, or the coffee lands of Brazil and the Central American States. It would be safe to say that the crops generally could be doubled and even trebled in those countries, on the area now under cultivation.

In India, where the Government is now devoting much time and money towards the improvement of agriculture, nearly one million tons of sugar have to be imported yearly. And yet probably over two million tons are produced in the country. It is said that the average yield of *sugar* per acre in India is less than half a ton, while the average is not much better in Cuba, where also some two million tons of sugar are produced per annum. Compare this with the average yield in the Sandwich Islands, where the utmost care is given to the question of fertilizing, with the result that an average yield of nearly *five tons* of sugar per acre is secured. Quite apart from good management and cultivation, which may do much, it is admitted that this splendid result is mainly due to carefully thought out fertilization. And it must be remembered that similar results are obtained, not in one year only but every year, by systematically replacing the plant foods which are removed by the crop. Making all allowances for any climatic advantages Hawaii may possess, there is surely no reason why India and Cuba should not at least double their sugar production on the land at present under cane. Even so, the yield would only be one-fifth of that of the Sandwich Islands.

The sugar crop is only taken as an example because of the extraordinary difference in yield shown between a highly fertilized crop, as in Hawaii, and the practically unfertilized crops in India and Cuba. The position is much the same with all crops in the Tropics. The wheat crop is, perhaps, the most important, and there is no question that much of the immediate anxiety about the world's food supply would be allayed if the vast area under wheat in tropical and sub-tropical countries were so treated as to produce something approaching its real capacity.

The problem is not an easy one, for in many cases the supply of pen manure is nothing like sufficient for the needs of the crop, and it may be thought that the cost of artificials would often be such as to prohibit their use, at any rate with profit to the grower. As a matter of fact, this would not be the case, except in isolated instances, and the grower must be taught the value of these (so-called) artificial plant foods. There are but few places in the world in these days where a demand for such commodities would not be met with a supply. The difficulty is that the grower—be he European or native—is, as a rule, reluctant to make an outlay on manures; and it is only after months, sometimes years of patient instruction and demonstration, that the expert's teaching bears fruit. The Government authorities in any country can do much, many of them are already doing a great deal in general agricultural education, but more can be done in pressing the important point of teaching the cultivators that they must, in their own interests, get the maximum yield from their land.

In most countries of the world there are representatives of the great fertilizer industries who are energetically carrying on propaganda work to this end, by teaching agriculturists, in a practical way, the value of good cultivation and systematic and judicious fertilizing. The benefit of such teaching is becoming more and more manifest in European countries, and it is to be hoped that the efforts of such bodies as the Potash Syndicate and the Chilean Nitrate Committee will be duly recognized by the Government authorities in those tropical countries where propaganda work is now being carried on or is in process of being initiated. Propaganda, whatever the object in view, is necessarily up-hill work and slow in its results; it requires encouragement, and Governments can do much to assist the movement by giving facilities for the cheap transport of fertilizers and agricultural implements, by passing Fertilizer Acts to protect their agriculturists, and by initiating a system of practical demonstration by their own experts. These latter should not be on the scale of the infinitesimal experimental plots of the scientific institutions, but on an area sufficiently large to prove beyond reasonable doubt the supreme importance, and incidentally the financial value to the grower, of systematic and judicious fertilization.

It can hardly be gainsaid that a successful agricultural industry is vital to the interests of every nation, and therefore no Government can afford to ignore the efforts of those who, at their own cost, are so strenuously working to prove the necessity of securing the maximum yield from the soil to the benefit of producers and consumers alike.

We have observed with much interest the great strides made in Egypt in this direction during the past few years, as evidenced by the largely increased imports of phosphatic and nitrogenous fertilizers since 1908. In that year, for instance, the import of nitrate of soda was 15,000 tons, while in 1912 the figures had risen to over 56,000 tons. This only shows what can be done, even with the conservative native cultivators, if only practical steps are taken to educate them; and though the way may sometimes be long and the difficulties great, we have proof in these figures that the thing is not only possible, but can be successfully accomplished.

The Aborigines of Latin America.

ON the same day as Señor Arana landed in England to "face the music" of the Putumayo Commission, we finished reading the late Colonel George Earl Church's book on the "Aborigines of South America," edited by his old friend, Sir Clements Markham, K.C.B.,* since the gifted author was no longer with us to do so himself. Colonel Church was an American, of *Mayflower* descent from an old Oxford family, so we can almost claim him as English, and certainly the portrait of him at the commencement of the book is that of a typical Englishman. English or American, he was a great trail hunter, and has left us a record of the Indians of Latin America, their past and present habits, character and numbers, that no merchant or planter, no body of men, be they governors or governed, who are interested in South America and its future, can afford to ignore. The Putumayo scandal† and the Mexican excesses as described by Mr. Turner‡ tend to show that the labour in Latin America is being no better treated or preserved to-day than it was in the days of the Spaniards' *conquistadores*; and yet Latin America, capable as it has shown itself to be, with a fractional portion only of its area under cultivation, to produce "shiploads and shiploads" of food-stuffs, how can it ever be developed and opened up without ample labour supplies? Where can such supplies come from? Can any of the local Indians be turned into agriculturists? (some, we feel sure, could in time, but that does not mean next year, or the one after). What will be the quickest, surest, and least costly way of opening up the inaccessible centres, and letting in light, air, and real civilizing civilization, not civilization in the ironical sense in which Colonel Church was so often forced to use the word. Those seeking a solution of these different queries will find the book under review of enormous help as a start, for it goes right down to the rock bottom of all things relating to the subject, and those seeking to develop South America must go to such depths before they can hope to build up the agricultural and commercial industries of the Amazon Valley successfully. For rubber men, and those now seeking to open up the rubber forests of the Amazon and place them on a basis to compete with rubber at 1s. 6d. per lb. from the East, there is much to learn in this book also. The details given of the large inland seas that formerly existed until they found an outlet to the sea, and formed the huge waterways, also will have to be taken into consideration by those who in the future will be wanting to open up and drain the forests, thereby rendering them more healthy and accessible. Then, again, we have always maintained that, if for no other reason, the Amazon rubber industry is bound to fall away as the Eastern plantation comes up, simply because of the lack of food supplies at the tapping centres, and the present (absolutely needless) cost in life, health, and money to bring down the supplies. This matter is truly described by Colonel Church (p. 13) in the

following sentence: "It has been argued that the tribes of Amazonia lacked the mental qualities necessary to enable them to emerge from their savage state; but the question may be asked: What has civilized man been able to accomplish during the four centuries he has occupied the valley? Does he also lack the attributes or fitness to combat the forces of Nature, develop and utilize the resources of the valley, and make it the home for one or more great peoples? In reality, with all his advantages, he is worse fed there than were his aboriginal predecessors."

Colonel Church is right: Civilized white or half-white man, in the aggregate, is helpless in the tropical forest; and yet, poor blind mole that he is, he is still killing off the only means he has of ever getting at home there. In the same way as ant-paths tend to help animals to make ways through the forests, and hunters follow these tracks, which none but they can distinguish, so can Indians be made to settle on and open up the interior of the forests and squat there, producing crops, fowls, &c., on which rubber collectors can be fed by barter, but which to this day they cannot, apparently, produce themselves. But to force the Indians to gather rubber is a different thing, although they may be induced, *by example, not force*, to do even that in time. Let, therefore, the Peruvian, Brazilian, and other Governments see to it that the Indians are no longer molested, but tempted (as we have to tempt Englishmen to settle on the land in Canada and Australia) to take to planting, as the Putumayo report shows they will do; then white or half-white rubber gatherers can draw supplies from them, and pay for them always in full. Each then will help the other, and both help Latin America to maintain its position as a rubber-producing centre. Those interested in such matters will find Colonel Church's book invaluable. Students of Latin America will be unwise if they do not add it to their bookshelves; we are placing ours where it will not be "borrowed" in a hurry.

The Plough in the Sugar-cane Field.



WE reproduce above from our contemporary, *The Australian Sugar Journal*, to show that ploughs can be utilized, as is done in Queensland, not only for planting canes, but also for covering them over, after the lengths of cane have been laid in the furrows, thus doing away with the present costly method of doing such work by hand.

* London: Chapman and Hall, Ltd. Price 10s. 6d. net.

† "The Putumayo—the Devil's Paradise," by W. E. Hardenburg, C.E. Fisher Unwin, Adelphi Terrace, London, W.C. 10s. 6d. net.

‡ "Barbarous Mexico," by John Kenneth Turner. Cassell and Co., London. 7s. 6d. net.

INDIAN TEA ASSOCIATION NOTES.

THE season has closed in Northern India, and the previous estimate of an increased crop of 22 million lb. is confirmed. One of the features of the year has been the great diversion of supply from the United Kingdom; the total quantity entered for shipment to other countries being 74 million lb., an increase of $13\frac{1}{2}$ millions more than other markets took last year, thus relieving the London market of too heavy supplies. Prospects from most districts generally favour an early season, rain having been general.

The course of lectures on "The Economics of the Tea Trade," referred to in our last issue, proved most interesting, and have been well attended. We congratulate the London School of Economics on having arranged them, and hope others will follow on cacao, coffee, &c. The difficulty has been to compress into the short course the many problems connected with this important industry, its history, and development up to the present time.

Dr. Chandler, the lecturer, handled his subject in a masterly manner; the lantern slides shown giving views of plantations, methods of cultivation and manufacture, and diagrams added greatly to the interest of the lectures. In the first lecture the history and development of the industry were touched on, the need of a thorough knowledge of the scientific principles underlying the methods of tea planting explained, and the comparison sketched as to the primitive methods at first adopted (learnt from Chinamen, who were imported by Government to start the first plantations), and those now in vogue under the guidance of a highly-trained scientific department, gained from the experience obtained by adopting modern applications of agricultural experiments. Anyone doubting the utility of establishing agricultural colleges, where students can specialize after laying the foundation of their training on this side, should attend such lectures, as they could then realize how badly a scientific training is needed first here, and later on estates or experimental gardens abroad.

The lecturer showed that the world's production of tea in 1912 amounted to 730 million lb., valued at £18,200,000, while the distribution of that enormous quantity in the ten principal consuming countries showed a *per capita* consumption of about 3 lb. per head. Of these, English-speaking countries consumed 5.16 lb. per head, other countries 0.63 lb. per head; the British people, with a *per capita* consumption of 6.2 lb., were easily first. The gradual rise of the British industry in India and Ceylon, and the corresponding decline of China teas for the British markets were sketched, as well as the later development of Java as a formidable producing country.

In the second lecture climate and soil were dealt with, and cultural methods. Tea was one of the few perennial plants grown for the sake of a leaf crop, of which there were not many, but the lecturer mentioned such as Yerba Maté (a South American holly, used as an infusion like tea), cocaine (from the leaves of *Erythroxylon coca* in South America), and certain fibres.

Tobacco was another leaf crop, but was an annual. The book on "Cacao Fermentation," now in the press, and which we hope to issue in the autumn, will include articles on the comparative fermentation of

tobacco and tea as well. The lecturer then described what leaves were wanted, how gathered, and the system of pruning necessary to produce the essential leaves, the unnatural treatment to which the plant was subjected, and the measures taken to meet the strain upon the plants under modern conditions. How the weakening of the plant, resulting from long continued plucking and pruning, predisposed it to its abundant enemies, the various blight and rusts brought about by insect and fungus parasites.

A diagram showed that tea was successfully grown between latitudes with no less a range than 70° — 40° N. in Russia, and 30° S. in Natal. Tea was found flourishing in the hot, steaming climates of Assam, Ceylon, and Java, in the cooler hilly districts of Darjeeling, Kumaon, and the Nilgherries, and in China and Japan; but, while this was so, it was pointed out that all great tea-growing countries lay within a relatively restricted area of some 40° of latitude— 30° N. and 10° S.—and 60° of longitude. Tea did best in a warm, sub-tropical climate rendered continuously moist and steamy by a rainfall of not less than 60 in. per annum. Altitude had a profound effect on the character of tea, and though tea would grow on many soils, yet to grow it to perfection, and to cope with the great demand made upon it for repeated flushes, it must have a soil rich in nitrogenous organic matter, well drained, and deep enough to allow of its long tap root and abundant root system.

As regards the manuring of tea in India, although there may be some estates the soil of which is at present rich enough to produce satisfactory crops, by far the greater number of estates cannot boast of such a privilege. Their soils as a rule are deficient in one or more of the fertilizing ingredients required by the tea plant, and become more so either through not being manured at all, or by the use of manure made on the estate, which, while only restoring to the soil a portion of the plant food removed by the crop, at the same time supplies a far from well-balanced plant-food. In order to maintain the fertility of gardens of good productive power, and to make the inferior ones pay, the application of artificial manure is essential, and same may be applied as follows:—

For loam soils, which as a rule are well provided with available potash, and are not especially deficient in phosphoric acid and nitrogen: 2 cwt. basic slag, or 1 cwt. concentrated superphosphate, 4 mds. castor cake, $1\frac{1}{4}$ cwt. nitrate of soda, and $\frac{1}{4}$ cwt. sulphate of potash.

For clay soils, which as a rule are well provided with available potash, but deficient in phosphoric acid and lacking in organic matter: 3 cwt. basic slag, 6 mds. castor cake, 1 cwt. nitrate of soda, and $\frac{1}{4}$ cwt. sulphate of potash.

For sandy soils, which are generally deficient in all three ingredients, and likewise in organic matter: $2\frac{1}{2}$ cwt. basic slag, 6 mds. castor cake, 1 cwt. nitrate of soda, and $\frac{1}{2}$ cwt. sulphate of potash.

For peaty soils, which are generally rich in nitrogen, and deficient in potash and phosphoric acid respectively: $2\frac{1}{2}$ cwt. basic slag, $1\frac{1}{4}$ cwt. nitrate of soda, and $\frac{1}{2}$ cwt. sulphate of potash.

Regarding the application of the manures, basic slag

is best applied at the time of pruning, and buried in with the prunings; doing so tends to discourage pests. Castor cake, sulphate of ammonia (if used instead of nitrate of soda), and sulphate of potash may be mixed together and applied three or four months later. Nitrate of soda must be applied at the time it is required, in small doses, not all at once. When stored away this manure must be kept in a very dry shed. We believe that with practice complete manures could often be applied with advantage in liquid form through a hose or irrigation pipe, as by such means each plant would be more likely to receive its proper quantity, and that, too, in a form in which it is easily assimilated by the roots.

According to Messrs. Wm. J. and H. Thompson, the deliveries of tea in the United Kingdom for the month of February were about $1\frac{1}{4}$ million lb. less than last year, but re-exports were nearly $\frac{1}{2}$ million lb. larger, and confined chiefly to Indian tea. The imports for the month were in the aggregate about $\frac{1}{2}$ million lb. less, all growths but Java, which showed a notable increase of $1\frac{1}{2}$ million lb., being in deficiency. The stock of all tea in the United Kingdom at the end of February was $130\frac{1}{4}$ million lb., being rather over $4\frac{1}{4}$ million lb. in excess of last year, and showing an addition of only $\frac{1}{2}$ million lb. since January. It is noteworthy that while the holdings of Ceylon tea are about $2\frac{3}{4}$ million lb. less, those of Indian and Java are over $6\frac{1}{2}$ million lb. more, Java alone contributing an increase of nearly $4\frac{1}{2}$ million lb.

The demand for Indian tea at the sales during the second week in March was rather less active and a quieter tone prevailed, though no quotable change in prices was noticeable except for the commonest descriptions, which were distinctly easier. The average for the whole sale (45,328 packages against 30,759 last year) on garden account was 9d. per lb. compared with $8\frac{1}{2}$ d. per lb. a year ago. The average for Ceylons was $9\frac{1}{4}$ d. per lb. against 9d. per lb.

"Tropical Life" and the London School of Tropical Medicine Fund.

"As my readers know," wrote Alert II, in the *Financier* of February 26th, "this paper recently helped in the appeal for the Tropical Medicine Fund, and so far £50,000* has been subscribed out of the necessary £100,000. In aid of this good cause the able Editor of TROPICAL LIFE has in the February number of his monthly published a couple of striking cartoons. The first depicts Mr. Austen Chamberlain, Chairman of the Fund, urging John Bull to subscribe; the other shows a planter in a tropical swamp sick unto death, surrounded by pestilent parasites, labelled malaria, yellow fever, and sleeping sickness. This vivid drawing by Mr. Jack Walker should surely bring in the balance of money required for the adequate tackling of the awful scourge."

From elsewhere we have received letters complimenting, congratulating, and thanking us for publishing the cartoon and leading article on the appeal, among them one from Mr. J. C. Davidson, of the Colonial Office, who, writing on behalf of the Secretary of State for the Colonies, said:—

"Mr. Harcourt wishes me to tell you that, since he takes such a keen personal interest in the prevention and cure of tropical diseases, he is delighted to see the prominence which has been given to the appeal on behalf of the London School of Tropical Medicine in the number of TROPICAL LIFE which you have so kindly sent him."

We see by the last list to hand that Messrs. Arthur Lampard and C. Heath Clarke (of Messrs. Harrison and Crosfield, Ltd.) have again not only increased their donations to £500 (each), but still hold to their promise to double the amount already given if a certain amount (in this case the whole £100,000) is forthcoming. This will mean that these gentlemen will be giving £1,000 each (for, of course, the Tropics by sending in their share will cause the six figures to be reached), and whilst thanking them, we hope others will also double their subscriptions, whether five or five hundred pounds, in celebration of the event.

"Tropical Life" at the Play.

REMEMBERING what Sir Bamfylde Fuller had said at the Royal Colonial Institute about the Aryan tribes in India of to-day owing their origin, but not their lack of energy, to the dwellers in Northern Europe, we were more than usually interested with the modes and means of life as shown in Ibsen's play, "Kongsemnerne," in its anglicized form of "The Pretenders," which, up to March 15th, was being acted at the Haymarket Theatre. Whether the American Indians also came from the same source we cannot say, but in truth, if the Chiriguano and the Carajo Indians of modern Latin America were, and still are, less civilized as regards animal comforts than the Norwegians in the time of Bishop Nicholas, they certainly could not have been more indifferent to the taking or giving up of life than were Hakon's men, who waited outside the Elgesaetier Convent and killed the unarmed Duke Skule and his son as though they were cattle, or the Duke and the youth in the way they went out to meet death.

We agree with Mr. William Archer when he expresses regret that, although this wonderful play could have been produced in England twenty-five years ago, it remained for Mr. Frederic Harrison to give us the privilege of seeing it, for the first time, so far as we know, at the Haymarket. All the leading character actors of Scandinavia and Germany have found in the character of Bishop Nicholas one to offer the greatest opportunities of proving their merit, and certainly the task was worthy of any man; a more enthralling figure and scene than of this dignitary of the Church, schemer, coward, and yet ruler of the fates of men, will be difficult to find, and Mr. William Haviland, who took the part, acted so truly up to it that we do not mean to let many plays pass us in which his name appears. Mr. Laurence Irving, as Earl Skule, ran him very close, both in the importance of the character he undertook and his rendering of it. Hakon Hakonsson, the elected king, against whom Skule and his followers in rebelling become "The Pretenders," was acted by Mr. Basil Gill, who well supported the two dominating figures in the play, which we are glad to have seen.

* To date we believe over £55,000 have come in.—T. L.

Economic Zoology.

THE PLUMAGE TRADE.

To the Editor of "The Times."

SIR,—The majority of the readers of your paper must be aware that a bitter contest is being carried on between those persons who trade in the plumage of birds and those who are anxious to save from extermination the many beautiful feathered creatures that are killed for the sake of their plumage. The traders are fighting for the right to import plumage into Great Britain, since the loss of this right would destroy a trade in which thousands of persons find employment.

The friends of the birds, whom we may perhaps designate the protectionists, are endeavouring to induce the British Government to prohibit absolutely the import into the United Kingdom of the plumage of practically all birds save that of the ostrich and those of which the flesh is eaten as food.

Several Bills have been introduced into the House of Commons with this object, but hitherto these have all been blocked by the trade. So far as we can see there is not the slightest chance that any Bill prohibiting the import of plumage will become law. Even if such an Act were placed on the Statute Book, the benefit to the birds would be small unless either similar enactments were passed in all European countries and in the United States of America or laws were passed prohibiting the export of plumage from the various tropical and sub-tropical countries in which the feather-yielding birds occur.

Those who have followed the controversy know well that there is not the least likelihood of the other European countries passing Acts prohibiting the import of plumage.

As recently as last March the French Government stated that it had no intention of giving its adhesion to a proposition to prohibit the import of plumage into France, because such a prohibition would have the effect of causing very great loss to an industry which supports a French working-class population of at least 50,000 persons and involves a turnover of more than 100 million francs. It is equally certain that export will not be prohibited from the countries whence the feathers come.

The Government of India, it is true, issued in 1902 a notification prohibiting the export of plumage from India. This notification is still in force, but is to a large extent rendered nugatory on account of the ease with which egrets can be smuggled. So long as France and other countries import plumage the Government of India's notification is likely to be evaded.

Thus the birds are being slowly but surely exterminated, while the traders and protectionists are fighting one another. This is coming to pass in spite of the fact that both sides are, or ought to be, anxious to prevent the extermination of the birds! This is a sad state of affairs. Our object in writing this letter is to indicate a course which, in our opinion, should effectually protect the birds and satisfy the more reasonable of the traders and protectionists. We believe that the interests of the two parties are not necessarily incompatible. Obviously the trade cannot

wish for the extermination of the birds, nor can it look upon their extermination with indifference. What the trade objects to is the abolition of the traffic in bird skins as regards the United Kingdom.

We maintain that this traffic, if it be properly managed, can be carried on without fear of extermination or even any diminution in the numbers of all, or nearly all, the birds affected. The birds of all tropical and sub-tropical countries are a valuable commercial asset.

To prohibit altogether the export of plumage, as the Government of India has done, is a clumsy method of preserving the birds. Had the export of plumage from South Africa been prohibited before ostrich farming was discovered that thriving industry would never have been established. We advocate the appointment at an early date of a Commission to take evidence with a view to ascertaining the extent to which the trade in the skins and feathers of birds may be carried on consistently with the maintaining of the numbers of the birds affected.

The subject is a big one. In the case of many species there is at present not sufficient evidence available to show whether or not the traffic in their plumage can safely be permitted, even if carefully regulated. In the case of other birds there are, we believe, sufficient data on which to base the assertion that the trade in their plumage can safely continue under specified restrictions. At the risk of trespassing on your valuable space we beg leave to cite a few instances.

In the case of such polygamous birds as the monal or Impeyan pheasant (*Lophophorus refulgens*) it is well known that a judicious thinning out of the cocks is beneficial to the species, because the unmated cocks worry the hens and interfere with their breeding arrangements. As the trade require only the skins of the cocks it is obvious that numbers of these can be supplied in places where the birds are numerous without reducing the numbers of the birds.

This is not mere conjecture. The experiment has been tried and has proved successful. Moreover, pea-fowl and the various pheasants can be farmed. Pea-chicks are reared in the Zoological Gardens at Lahore by hatching the eggs in an incubator and giving over the young birds to the care of the barndoor hen.

An enormous trade is carried on in the nuptial plumes of some species of egret. These plumes are known in commerce as "ospreys." There is no reason of which we are aware why egret farming should not prove as profitable as ostrich farming.

Moreover, since egrets nest in large colonies it should be possible, with proper management, to remove the nuptial plumes from wild birds without harming them. Some of the birds of which the plumage is largely imported, notably the Indian paroquets (*Palæornis*), are very destructive to the cereal crops. In some parts of India these paroquets are so numerous as to be a scourge to the cultivator. In such localities the paroquets might, with advantage, be judiciously weeded out.

Thus, it should be the duty of the Commission we advocate, after having satisfied itself that the traffic in the skins of certain birds can be carried on under proper restrictions without fear of extermination, to formulate proposals regulating the traffic. The sug-

gestions of such a Commission would influence foreign Governments, for no one wishes to see birds of beautiful plumage or sweet song disappear.

Trade in the skins of birds of which the case is not free from doubt might be prohibited pending further local inquiries. The trade would surely be willing to put out of fashion birds declared to be in danger.

As regards India, the Government could, if it wished, supply the trade with the skins and feathers of which the Commission approves of the export, but it would probably prefer to lease out the right to collect the plumage to approved individuals and impose an export duty on the products. In the District Officer and his staff, to say nothing of the Forest Officer, the Government of India possesses an efficient organization for protecting the birds by preventing poaching and illicit collection and for realizing revenue from their plumage. Further, the Government could at a very small cost procure the useful services of the not inconsiderable class of professional bird-catchers.

We believe that the above scheme will commend itself to the more reasonable of the plumage traders, and that they would co-operate in helping to protect those species which are found to require absolute protection.

Possibly our scheme will not commend itself to the extremists among the bird protectors. These will, perhaps, regard it as the thin edge of the wedge. We would assure such that our proposal is nothing of the kind. We formulate it because we believe that it is the only feasible method of protecting the birds. To protect the birds efficiently in the teeth of the opposition of the plumage traders is impossible, to do so with their help is an easy matter.

D. DEWAR.

Care of Grindlay and Co.,

F. FINN.

54, Parliament Street, S.W.

Our Editor sent the following letter in reply:—

SIR,—Leaving your readers to study the suggestions made in above letter as to how the birds can not only be saved from extermination, but their numbers greatly increased, as with game in England, whilst the trade can continue as freely as ever, I would like to add that in “another place,” i.e., in an Anglo-tropical journal, a section specially devoted to economic zoology is striving to show how important bird-breeding industries can be established in tropical and other centres, at many of which the climatic conditions would allow of their being carried on by English families. Such establishments could breed the different varieties of egrets, pheasants, game birds, ducks, pea-fowl, and many other birds, not only to ship the plumes of varieties now known to ornithologists and the trade, but by careful and scientific cross-breeding and “Luther Burbanking” the birds, to evolve new colours and effects, so as to feed our trade with novelties at present unknown, and so cause the fashions to change far more often than they have done of late, thereby giving each particular strain time to recover. Many of these crosses would probably not breed; so far from reducing the birds, the trade would alone be the means of increasing the numbers and varieties. I am told some striking effects have already been obtained by crossing Javanese and Indian

pea-fowl, as can be seen in the section devoted to hybrid birds at the Natural History Museum, South Kensington; also by such crosses as the Golden and Lady Amherst pheasants. In this case the hybrid, being fertile, can be propagated to any extent, instead of having to be rebred each time.

At the end of September I went specially over to Paris to make inquiries into the matter, and, with M. Amédée Pichot, son of the founder of the *Revue Britannique*, visited the Jardin d'Acclimatation to see the birds and animals there and to discuss the subject of cross-breeding birds. Of the animals, I was principally concerned with the guanaco, llama, and vicunas, some of which seem likely to become dangerously scarce unless prompt attention be given to their preservation, in which case I believe important industries could be established. Since my return I have written an article on the guanaco, which is shortly to be published.* I wonder how many of the opponents of the bird-millinery trade have troubled themselves about this animal.

With what I have learnt in Paris and London, coupled with my own (now nearly thirty years) experience of the Tropics and its birds, I am certain that if it is *only* extermination that is feared, the whole controversy can be ended, and both sides brought together to prevent this, in a very short time. I therefore appeal through your columns to the head of the India Office and to the Secretary of State for the Colonies, and others who believe in keeping this important trade for England, especially London—once there is no fear of the birds being exterminated or becoming even scarce—to bring about a meeting, without including the ultra-humanitarians and the faddists (who have already had more than their share of attention), to hear what practical men, and those who have had long experience in the matter, have to say.

The following extract from a letter (dated January 1st) written to Messrs. Dewar and Finn by Mr. C. F. Downham, the most prominent member of the Plumage Committee of the London Chamber of Commerce, confirms my views that, given a fair hearing before an impartial committee, the controversy will soon be ended:—

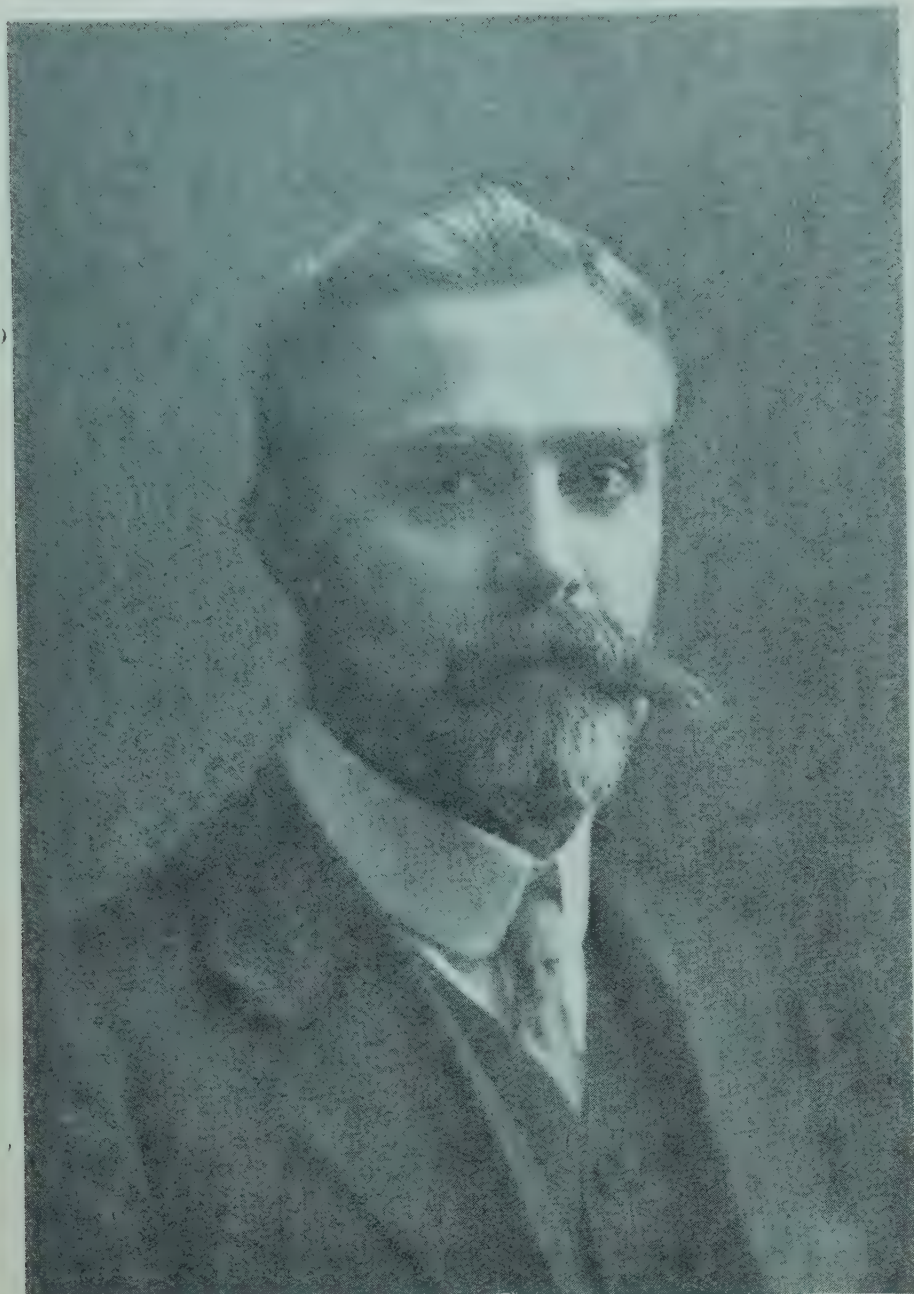
“I have read with great interest your letter to the *Times* of December 25th last.

“As an active member of the Plumage Committee of the London Chamber of Commerce I think I may venture to express, on behalf of the trade, its appreciation of the views and suggestions contained in your letter, and the fair and reasonable manner in which you have regarded its attitude in the controversy. I hope at an early date to see your letter fully discussed by the Plumage Committee, and I have no doubt you will in due course be advised that its assistance will be at the disposal of yourselves and others who no longer desire to see this all-important question of the protection of birds confused by such unreasonable measures as the Plumage Bills have proved to be.”

Since, then, all sides seem holding out the calumet of peace, I hope those wishing to see the matter settled will join in the circle and discuss the pros and cons of the case.—I remain, sir, yours very truly,

HAROLD HAMEL SMITH, *Editor TROPICAL LIFE.*

* This appeared in our last month's issue.



"Tropical Life" Friend.—No. 93.

MR. FRANCIS CROSBIE ROLES.

Editor-in-Chief of the *Times of Ceylon*

"OUR FRIEND" this month is well known to all up-to-date tropical agriculturists, as well as to the leading men in the "allied trades," who handle the produce and import estate supplies. This notoriety is by no means due to self-advertisement; but no one can take a leading part in the management of one of the two chief papers of an island like Ceylon without soon becoming acquainted with all who are worth knowing in tropical circles. Before going to Ceylon "Our Friend," as a member of the old National Association of Journalists of Great Britain and Ireland, became an original member of the London Institute of Journalists on its formation in 1889, being elected a fellow in 1901; and as, added to this, Mr. Roles has been a leading overseas member of the Empire Press Union from its inauguration, it goes without saying that he is well known in journalistic circles on this side.

"Our Friend" went out to Ceylon when twenty-one years of age. He returned to England in 1893, but on receiving the appointment of sub-editor to the *Times of Ceylon*, he returned to that island in 1895, being promoted to leader-writer in 1897, and becoming a partner in the concern in 1900. The island

press is obliged to Mr. Roles for the able way in which he drafted the original of the Foreign Press-Messages Copyright Ordinance of 1898, by which forty-eight hours' protection after publication was afforded to those journals. A life fellow of the Royal Colonial Institute, "Our Friend" was recently elected on the Council of the Empire Press Union, as reported in *TROPICAL LIFE* at the time, and he also represents the Central News of London. The subject of this sketch had early taken a lively interest in the prospects of plantation rubber, and in 1906 he made a tour of the Federated Malay States. Under a scheme by Governor Sir Henry Blake to promote the cultivation of rubber and cotton under irrigation, "Our Friend" attempted to grow these products under Vakaneri tank in the Eastern Province, but without success as regards *Hevea brasiliensis*. A similar effort in the Hambantota district also failed, and it would appear that the supply of water to the roots does not efficiently take the place of rain upon the leaves. In 1908 Mr. Roles visited Burma to conduct a public-spirited inquiry into the prospects of securing increased supplies of rice for the tea and rubber estates of the island. He was the Ceylon delegate to the first Imperial Press Conference, held in London in 1909, and took a leading part in its proceedings, proposing the principal resolution on the necessity for substantial reductions in the then existing press cable rates. He was here again in 1911, on the occasion of our present King's Coronation, when he was nominated to a seat in the Abbey by the Governor of the Colony, Sir Henry McCallum.

Outside journalism "Our Friend" acted as treasurer of the Ceylon Branch of the Royal Asiatic Society for eleven years, and is a life member of that body. Married in New York in 1896 to the only daughter of the late Mr. John A. Nichols, a lawyer of New York City, Mr. Roles has visited the United States, officially and privately, on four occasions, as on the occasion of the St. Louis World's Fair (1904)—when he was appointed an Official Visitor to the Ceylon Court by the then Governor, Sir West Ridgeway—and again last year as Commissioner to the New York Rubber Exposition. The compiler of the Rupee and Straits Dollar section of the "Tropical Investors' Guide," the sixth edition of which is now being prepared—and which is annually added to the *Financier* Sterling Rubber Company volume, by arrangement with the *Times of Ceylon*—Mr. Roles, needless to say, has also carefully studied coco-nut cultivation, and tropical agriculture generally.

He is the author of a brochure on rubber planting, and is, if we remember rightly, connected with more than one plantation company. Now that he expects to spend much of his time in the old country, leisure and keenness will enable him to take part in public affairs connected with the Tropics, and his experience and judgment will, we feel sure, be acceptable in various directions. His comprehensive report to the Ceylon Government on the recent International Rubber Exposition, a copy of which is to hand as we go to press, is evidence that he prefers work to rest. An ardent advocate of agricultural banks—in Great Britain as well as in the Tropics—it may be added that his views on the need of establishing a College of Agriculture in Ceylon are heartily in accord with those of *TROPICAL LIFE*.

Business Notices.

1.—The address of TROPICAL LIFE is MESSRS. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

MARCH, 1913.

Agricultural Colleges for the Tropics.

"THE TIMES" STRONGLY SUPPORT THE PROPOSALS.

AWAY back in 1909, when, as now, we were urging the claims of the London School of Tropical Medicine by publishing a series of articles on the benefits they were conferring on the Tropics, we wrote as follows in the direct appeal for subscriptions which we published, at the head of each article: "The trade of this country needs extending; we are told that we are already the heaviest taxed nation on earth, whilst it seems doubtful if we are the wealthiest. We hear a good deal about the necessity of 'broadening the basis of taxation,' but far too little about broadening the basis of earning the money out of which the increased taxation is to be paid." If these remarks were true four years ago they are doubly true to-day when, as we stated last month, the ratio of taxation and the cost of living generally is increasing more rapidly than the income of wage-earners and many others. The middle and upper-middle classes must be especially hard hit just now, but, fortunately for them, they have the Tropics to turn to, and the brains, energy and enterprise to develop the resources of these wonderful centres containing incalculable riches, which in the aggregate would cause the contents of Aladdin's cave to take quite a back seat, or, if such a phrase savours too much of "slang," to occupy quite a minor position in comparison.

Like Aladdin's cave, however, these riches are inaccessible to all but those who have the password, which in the modern tale becomes "experience." To obtain this magic word has, like the fairy-tale, caused the death of some and brought serious loss and grievous disappointment to others. Hitherto we have been

content to leave it too much to chance or luck (coupled always with great enterprise and perseverance), but of late years those setting out to find these riches have realized that they run far more chance of securing them if they go equipped for the task, that is, in plain English, if they first educate themselves to become tropical experts.

Knowing this from our own experience, and realizing where we fell short when we made the quest, we have always been keen advocates for training young men in the Tropics, as well as on this side, to enable them to obtain that experience without which they can never, taken as a whole (for the exceptions who do so only go to prove the rule), expect the Tropics to "open sesame" and allow them to secure the riches stowed away inside.

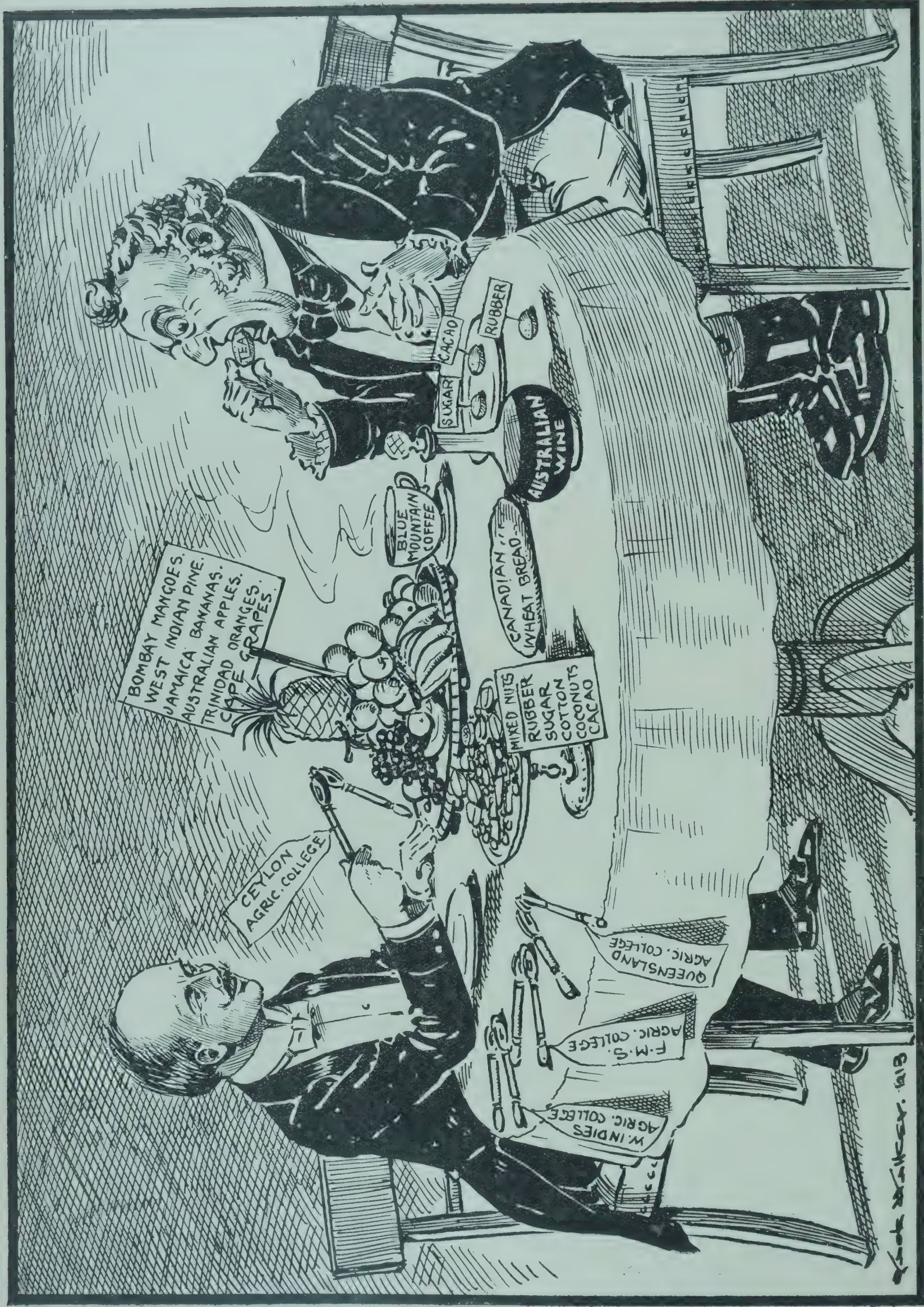
For a time we cried alone in the wilderness. Then Professor Dunstan gave us a lead by contributing his now well-known introduction to our book on "Soil and Plant Sanitation," in which he referred to our articles and suggestions on the matter. Now we have many friends; and this year, although not two months old at the time of writing (February 26th), has caused that good friend of the Tropics, the *London Times*, to publish a leading article (on January 23rd) and two important letters: (1) by Colonel Arnold, on February 3rd.; (2) by Mr. John McConnell,* on February 14th, urging the establishment of such colleges.

Those, therefore, who remember what we have said, or who will take the trouble to refer back to these contributions on the subject, will be glad to know that the article and letters in *The Times* confirm and support all we have urged on behalf of establishing one or more Agricultural Colleges in the Tropics.† At the risk of greatly exceeding the space we usually allocate to our leading article, we would draw our readers' attention to the following, so that the many friends abroad who are fighting with us to get agricultural colleges established in Ceylon, West Indies, Malaya, and Australasia, will see how far we have got in the matter. "We are glad to learn," says *The Times*, "that the matter has, we believe, attained the qualified success of receiving official consideration"; we can confirm this statement as regards the Colonial Office, and also because, on sending a copy of TROPICAL LIFE for January, 1911, to our

* Who represented the British Cotton Growing Association at the West Indian Agricultural Congress last year; see TROPICAL LIFE for March, 1912, with portrait group of the delegates, in which Mr. McConnell is seen on the extreme right of the front row who are sitting.

† As, for instance, "An Imperial Department and Bureau of Agriculture," March, 1909; "The Question of Agricultural Education," October, 1909; "The Need of a Bureau for the Distribution of Agricultural Literature" (September, 1910), and also a paper read before the London (1911) Rubber Congress; our own remarks on the need of more assured means of securing a tropical agricultural training in our book on "Soil and Plant Sanitation"; "A Tropical Memorial to King Edward VII, i.e., a Tropical Agricultural College," January, 1911; "A Lectureship in Tropical Agriculture," January, 1912; "The Need of Organization in Tropical Agricultural Education," March, 1912; "The Trinidad (B.W.I.) Press on the Need of a Tropical Agricultural College," also March, 1912; "Agricultural Education," April, 1912; "A University Education for the Tropics and Colonies," May, 1912; "The Establishment of Tropical Agricultural Colleges in the Tropics," July, 1912. These articles have been reproduced, favourably criticized, or recommended as deserving attention by the financial papers on this side and the press abroad.

THE NEED OF AGRICULTURAL COLLEGES IN THE TROPICS.



JOHN BULL AND HIS NUTS.

Fingers, 'tis truly said, were made before forks, and teeth before nut-crackers, so likewise did our forefathers plough with a bent stick; but he who uses such things to-day will make but slow progress compared to his neighbours, for teeth break, and a bent stick is but a sorry implement with which to cultivate. — *John.*

THE EDITOR OF "TROPICAL LIFE" TO JOHN BULL:—"Come, I say, John, are not such ways rather primitive? Try one of these; they will give you what you want much more quickly and easily and save you money in the end."

present King, we received an acknowledgment, as stated in the February issue of that year, p. 22, as follows: "The paper has been laid before the King, and I am commanded to thank you for same." In their leader of January 23rd, which discusses Mr. Norman Lamont's* book, "Problems of the Antilles," we are told: "By failing to establish such a system (*i.e.*, a rational system of tropical agriculture) we are on the one hand wasting an enormously valuable asset, and on the other hand, stunting the expansion of industrial and social activity at home. Now, the greatest obstacle in the way of those who try to develop a tropical country is the want of men trained to deal with agricultural conditions at home. . . . The most accomplished agriculturist in this country, if called upon to deal with tropical crops, would find himself obliged to start again at the beginning. . . . A University of Tropical Agriculture ought obviously to be situated where the students will live and work in tropical conditions." Colonel Arnold wrote a letter, published on February 3rd, congratulating *The Times*, as we do, on this article, and confirming what we claimed for agriculture, as compared with mineral seeking, in our letter to the *Westminster Gazette*. "The prosperity springing from such (mineral) wealth," Colonel Arnold continues, "eventually becomes more or less dependent upon a simultaneous development of the agricultural resources of the country.† This applies even more to tropical territories than to more temperate ones. . . . A standard is required . . . (otherwise) the farmer in the Tropics . . . must spend many weary years in experimental work. A university appears to be indicated as the only remedy. A university duly organized would not only train men, but would collect and collate the scientific results of its own and other experiments." Finally, Mr. McConnell says, in his letter published February 14th: "If it can be shown that the production of cotton in the Empire would be helped by a tropical university, the need for such an institution is confirmed," . . . and he confirms it by stating: "The cause of failure (to increase the output of British-grown cotton) both in India and elsewhere, lies in the want of opportunity for scientific study. The place where the British Cotton Growing Association has achieved its chief success is the West Indies, and there the success is largely due to the scientific work of the Agricultural Department of those islands. In face of this, surely," concludes the writer, "it is the duty of Great Britain, which controls so large a portion of the Tropics, to study the laws by which the untold wealth of tropical agriculture may be made available."

"In face of the way in which these letters and the *Times* leader are supporting what the *Times of Ceylon*, the *Ceylon Observer*,‡ the West Indian Press and individuals in all parts of the Empire are urging, we feel one university at least should shortly be decided on for the Tropics. In conclusion, therefore, we would

say that now a start has been made there must be no turning back,* but all, working to bring this about, must continue to press forward until the foundation-stone of one, at least, of these four "Dreadnoughts" of tropical agriculture have been well and truly laid, and the income assured. This done, the benefits that will accrue from it will, we feel sure, soon lead to the establishment of the others.

BOTH those in favour of establishing agricultural colleges in the Tropics, as well as others who, up to now, have not given the matter their consideration, should note that during the month of January we had six inquiries for the name and address of a college or institution at which tropical agriculture could be studied wholly or partially. To our regret we could not answer these inquiries as decisively and satisfactorily as we would have wished. The following is a copy of the last inquiry to hand and our answer to same:—

"London, January 27th, 1913.

"Sir,—We have an inquiry from one of our friends to know where he could find a college at which to study tropical agriculture, so that he might attend same, and receive a certain amount of instruction."

To this we replied: "The best thing one can do at present is to get into contact with those who lay themselves out to give boys a special training for a Colonial and tropical life. We hope one day to see agricultural colleges established in Ceylon, the West Indies, Federated Malay States, and Australasia; until we get such colleges we suggest that you communicate with . . ."

"I CALCULATE that the quantities of plant foods removed in the (Hevea) latex, to produce 400 lb. dry rubber per acre in a year, equals $3\frac{1}{2}$ lb. nitrogen, 3 lb. potash, and $1\frac{1}{4}$ lb. of phosphoric acid (P_2O_5), against 41.7 lb. nitrogen, 36.5 lb. potash, and 20.5 lb. phosphoric acid withdrawn by an average crop of wheat."

"Although the experiments so far have been on a small scale, there is little doubt that the soils and climate of Malaya are ideal for the proper development of yams."—*F.M.S. Bulletin* for January, p. 217.

THERE is a large market for spraying machines in the Federated Malay States, says the American Consul, who believes that there is also a good demand for the same in Java, Sumatra, and Ceylon. Advertisers in TROPICAL LIFE know there are.

"THERE are few things in the commercial development of Western India during the last year or two more remarkable than the expansion of the oil-pressing industry, and we appear to be only at the beginning of things in this direction."—Dr. Harold Mann, Agricultural Chemist to the Government of Bombay.

* Mr. Lamont was "Our Friend" in April, 1906, whilst M.P. for Bute and Private Secretary to the then Prime Minister (Sir H. Campbell-Bannerman). According to the *West India Committee Circular*, Mr. Lamont first advocated a Tropical Agricultural College for the West Indies in 1902.

† As the Amazona Valley is, to its loss, as regards the mining of Black Gold, *i.e.*, in securing the rubber there.

‡ Tropical agriculture, like Tropical medicine, wants specialization, said a writer in this paper.

* In answer to a remark in the *Ceylon Observer*, we agree with that paper and Professor Dunstan that, if there is to be only one university to start with, Ceylon certainly ought to be chosen. We are equally certain that the second institution should be in the West Indies, preferably Trinidad, as the soil and climatic conditions generally of that island would, we believe, be found preferable to Barbados, which should otherwise be chosen, if only as the older colony.

Some Remarks on Coco-nut and Cacao Culture in Samoa.

By H. I. MOORS, Apia.

PART II.

THE natives, when clearing new land on which to plant the required number of coco-nuts, invariably plant taros, kava and other supplies, all of which are of high value to them; and there is no reason in the world why the foreign planter should not set out taro, yams, bananas, pines and other plants to help him through the lean years until the palms commence to bear or his cattle begin to return him an appreciable increase.

Taros and yams are saleable; kava occasionally produces satisfactory returns; bananas are useful and sometimes saleable; and pines, which might be grown by the million, could be canned and exported, or crushed for their delicious juice, and this bottled and sent away. An industry of this sort is just now starting in Samoa, and a good many acres are to be laid out in cacao and interplanted with catch crops of pines, which are to be canned without sugar for export to Germany. On the other hand, the originators of this enterprise will certainly find that their cacao will not bear as early as it would have done had they left out the pines: and it may not afterwards be as prolific, unless they make up with fertilizers the deficiencies in the supply of plant-food caused by extensive pineapple cropping.

The writer has so far noticed only one coco-nut disease which, though apparently widespread, is not disastrous in its effect. He is unable at present to say how it is caused or to suggest any cure for it. It only appears in young trees, *i.e.*, those less than three years old, and is mostly confined to those which are under two years. The leaves appear to suffer from lack of nourishment, and begin to wither up, commencing with the lowest branches. Sometimes the plant appears to recover, but this is seldom. If it is pulled out it will be found that the original nut which still adheres has rotted and emits a horrible odour.

When a planter sees such small trees about his place he is safe in removing them, and should disinfect the ground with lime, only setting in a healthy sprouted nut after the lapse of a reasonable period. This is the only disease, known to the writer, which has so far appeared in Samoa, but not the only pest.

In 1909 the Rhino beetle made its first appearance close by the Customs wharf, where all goods have to be landed. It is supposed that eggs of this insect arrived here in some of the cases which contained rubber plants. Before attention was seriously called to this plague, it had already spread to westward about eight miles and eastward about two miles from the wharf. The alarm was given, and very drastic measures were proposed for calling in a large force of natives, declaring the copra industry and every man's welfare threatened, and asking the diligent collaboration of everyone concerned. However, other counsels prevailed and a great opportunity was lost.

The beetle meanwhile has spread over about one-half the extent of the fine Island of Upolu, to which it is still limited, and is costing the administration a heavy sum each year; and also, as all able-bodied natives in the infected districts are commanded to hunt beetles every Monday morning, they are suffering more or less further inconvenience as well. Soft wood and coco-nut logs

are thrown together in squares of about 10 ft., and the centres then filled up with vegetable refuse so as to provide congenial breeding places for the beetles which patronize them with remarkable industry. Thus, the eggs and the larvæ are continually gathered from these traps, and the supply of beetles in various localities is diminishing, but it is not supposed that they will be eliminated, although some thousands of such traps are now in use. The insects attack the palms in the usual method and in many instances they kill them outright, particularly very young and very old trees.* Besides this, they do much damage to other trees which may survive, but which cannot resist this scourge, although at the same time they yield full crops until they succumb. One planter sends men into his trees to remove the beetles with bent wires, or to drive them out with an injection of bluestone water made strong enough to fatally affect the insects. When these are removed the trees are painted with a mixture in equal parts of coal tar and kerosene. This produces a sort of thick varnish, and it is declared that no beetle ever attempts to bore through it. So far about 5,000 trees have been treated in this way, some being mere shoots less than one year old. None of them appear to have been harmed, and none of them have been revisited by the beetles, although they swarm on neighbouring properties. If bluestone injection is used to kill the mature beetle as he lies in the hole which he has made, care ought to be taken to use a mixture that is not strong enough to destroy the palm. Several trees have, however, so far been killed in Samoa by over-powerful injections. As the branches grow the painting will have to be repeated, probably every four months, but it only takes 15 minutes, and costs 2½d. It has also been found here that cacao trees painted with the refuse of carbide of calcium whitewash are almost immune from the canker which in a very bad form is very prevalent in Samoa on neglected properties. Bud-rot has so far never shown itself in any of the islands of the Pacific. The Tonga group produce about the same quantity of copra per annum as is raised in Samoa, but owing to lack of regulation it is generally of a lower grade. Tahiti, the Marquesas, Potmutus, the Ellice, Phoenix and Gilbert groups in the South Pacific, and the Marshalls and Carolines in the North Pacific also produce much copra, but the industry cannot be greatly extended in the Coral Islands, although there are no plagues or disease, because the available supply of land is almost all used up.

The cultivation of rubber and cacao attracts more attention in Samoa than does the cultivation of palms, but when the canker seemed to threaten the cacao industry many colonists at once interplanted coco-nuts on their cacao estates, and they are now coming to the time when they will have to choose which plant they will permanently retain. By the liberal use of potash manures it has been found that the coco-nuts and the cacao have, so far, yielded maximum crops from the same land. Whether this can be depended upon to continue or not has yet to be demonstrated. The issue is an interesting one, and will be watched with much expectancy. Personally, the writer thinks that the cacao will decline in the long run and disappear, after the coco-nut palms have borne five or six full crops.

In conclusion, I would like to add that the general

* For full particulars of this pest, the *Oryctes rhinoceros*, see "Coco-nuts, the Consols of the East," pp. 270, *et seq.*

health of Samoa is excellent, probably better than that of London, Hamburg, or New York. The temperature seldom exceeds 82° F., so fevers are very uncommon. School facilities are remarkably good in all the lower grades, the Colonial Government schools being free to all.

About 1,300 Chinese coolies have been imported, and 600 new men are being sent for at the time of writing. These coolies mostly elect to sign on again in Samoa with new masters when their contracts are completed, thus testifying to their general contentment. It is expected that Javanese coolies may also be introduced in 1913. Suitable agricultural lands are worth, according to situation, from 10 dols. to 30 dols. per acre, and are not readily procurable. It is to be hoped that those in control will alter their views before long and allow the natives to lease for long terms of fifty or more years their surplus properties, which neither they nor their progeny can expect to put into service, for Samoa cannot advance much till then.

To Our Sisal Friends in German East Africa.

As stated on advertisement page xxxvi. we are offering a gold medal for the best sample of sisal fibre exhibited at the International Fibre and Allied Trades Exhibition, to be held in June next year (1914) which has been prepared by machinery, not hand-stripped, and we hope that there will be a good competition between producers. Apart from our friends in Yucatan, many other centres have been planting sisal for some years past. In Turk's Island, off Jamaica, for one, a determined effort was made some years back to place the industry on an assured basis. Queensland experts, especially Major Boyd, have for twenty years and more been urging planters there to plant at least a portion of their lands with sisal. Outside British territory and Mexico, the most important sisal-producing territory is German East Africa.

"The cultivation of the sisal plant in German East Africa has been carried on for some twenty years," *The Board of Trade Journal* tells us, "and it may be asserted with confidence that excellent results have been achieved and that there is a promising future before the sisal industry in that colony. No less than 11,212 metric tons (metric ton = 2204.6 lb.) of sisal hemp, valued at 4,530,000 marks (about £222,700), were exported from German East Africa in 1911, and it is authoritatively stated that the figure will reach 16,500 metric tons in 1912, and probably 20,000 metric tons in 1913. The advantages of growing the agave (sisal) plant are that it will thrive in different soils and under varied conditions. It is a good policy for the planter in growing sisal hemp to extend the area of cultivation as much as possible, for it should be recognized that a profitable use of the fibre separating machine can only be made by treating 100,000 to 120,000 leaves per working day. There is undoubtedly a shortage of native labour, and until that is solved it is premature to discuss the question of cultivation on a very extensive scale. According to expert opinion the prospect of over-production is somewhat remote, as the world's demand for fibre is constantly on the increase. As regards prices, even if they fell considerably below their present level, the cost of growing would still leave a fair margin of profit." From here at least, we shall therefore look forward to having a large and representative exhibit, but we hope the other centres will come in as well.

The Coco-nut Boom.

To support those anxious to see the coco-nut plantation industry developed on right lines, our Editor sent the following letter to the leading London newspapers, as well as to the *Manchester Guardian* and the *Liverpool Post*. We cannot say whether all those receiving the letter published it, but fear not. The *Financier*, *Financial Times*, *Financial News*, *Liverpool Post*, and the London *Globe* and *Express* did so, and also *Truth*, with a fillip of *sauce Tartare* of its own, and our best thanks are due to them for giving publicity to the subject. The following is taken from the *Financial News*:—

"COCO-NUTS, THE CONSOLS OF THE EAST."

Mr. H. Hamel Smith and Unauthorized Quotations from his Book.

We have received the following communication from Mr. H. Hamel Smith, Editor of TROPICAL LIFE:—

Sir,—Several prospectuses, advance notices, and other printed matter have come to my knowledge recently, from which I gather that an attempt is being made to educate the public up to a coming boom in coco-nuts. Some of the prospectuses, &c., contain quotations from my book, "Coco-nuts, the Consols of the East," particularly Sir W. H. Lever's "Foreword" to it, and from articles in my paper, TROPICAL LIFE.

Correspondents, in some cases perfect strangers to me, have brought the matter to my notice, and have asked me whether the statements are reliable, and if I can recommend investment. In these circumstances I ask the indulgence of your columns to state that in no case have I or my publishers been asked to give, or given, permission to use the extracts from my book or paper, and I would prefer that they did not do so; but my solicitors (Messrs. Withers, Bensons, Birkett and Davies) advise me that I cannot prevent such quotations from appearing.

I would also warn your readers against relying on any short quotations from my book or paper, without making themselves fully acquainted with the context, and would add that I have always been careful to warn my readers not to rely upon a larger annual average crop than 40 nuts per tree, or, at the most, 50 nuts from ten-year-old palms.—Yours very truly,

H. HAMEL SMITH,

Editor, TROPICAL LIFE.

112, Fenchurch Street, E.C.,

February 24, 1913.

OWING to the articles we have been publishing on drying by means of fans and hot air, a considerable number of inquiries have been received on this side. The Blackman Export Co., Ltd., in connection with these inquiries, have written informing us that, as they have found it necessary to acquire larger and more commodious offices to cope with the increase in the volume of trade for their Blackman and Keith Fans (no doubt due to a considerable extent to their telling advertisement running in our pages), they have left Finsbury Pavement, so will our readers in future, therefore, address all inquiries to their new address, viz., The Blackman Export Co., Ltd., "Blackman House," 374, Euston Road, London, N.W.

Cotton.

THE following were the prices for Cotton in London on March 6th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1912.		Compare	Good, 1911.		per lb.
	d.	to	d.	to	d.	to		d.	to		d.	to	
Surat kinds*	5 $\frac{7}{8}$	to	6 $\frac{1}{16}$	6 $\frac{1}{8}$	to	6 $\frac{5}{16}$	—	5 $\frac{1}{4}$	to	5 $\frac{7}{16}$	6 $\frac{1}{16}$	to	7 $\frac{1}{8}$
Madras	6 $\frac{1}{4}$	to	6 $\frac{3}{8}$	5 $\frac{1}{16}$	to	6 $\frac{5}{8}$	—	5 $\frac{1}{8}$	to	5 $\frac{11}{16}$	7	to	7 $\frac{5}{8}$
Bengal	—	—	—	5 $\frac{5}{8}$	—	5 $\frac{7}{8}$	6	4 $\frac{7}{8}$	—	—	6 $\frac{1}{4}$	—	—
Assam	—	—	—	5 $\frac{7}{8}$	—	6 $\frac{1}{4}$	6 $\frac{1}{2}$	5 $\frac{3}{8}$	—	—	6 $\frac{1}{2}$	—	—
China	—	—	—	6	—	6 $\frac{1}{4}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	—	—	6 $\frac{1}{2}$	—	—
West Indian	7 $\frac{1}{4}$	—	—	7 $\frac{3}{4}$	—	8 $\frac{1}{4}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	—	—	8 $\frac{3}{4}$	—	—
Sea Island	12 $\frac{1}{2}$	—	—	15	—	18 $\frac{1}{2}$	22	13 $\frac{1}{2}$	—	—	15	—	—
West African	5 $\frac{7}{8}$	—	—	6 $\frac{1}{2}$	—	6 $\frac{5}{8}$	—	5 $\frac{1}{16}$	—	—	7 $\frac{1}{2}$	—	—
East	6 $\frac{3}{4}$	—	—	7 $\frac{5}{8}$	—	9 $\frac{3}{8}$	—	6 $\frac{1}{16}$	—	—	8 $\frac{5}{8}$	—	—

* Liverpool quotations.

Fluctuations this week (ending March 6th) have been within narrow limits, showing a fall of 6 to 5 $\frac{1}{2}$ for old, and 3 $\frac{1}{2}$ for new crop deliveries. Spot is 4 points lower, viz., 6.82d. In East Indian very little business is passing.

The import into Liverpool this week amounts to 79,094 bales, since September 1st 3,570,582, same week last year 174,720, last year's total 3,589,729 bales. The estimated Sales amount to 48,000 bales, including "called." Middling American is quoted at 6.82d. per lb., last year 5.99d., 1911, 7.59d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.
Brought into sight	11,722,000	13,160,000	10,450,000
Exports from United States since September 1st—			
To Great Britain	2,916,000	3,241,000	2,929,000
To Continent, &c.	3,578,000	4,339,000	3,179,000
Total crop	—	16,138,000	12,120,000

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	March 6th.	Same time 1912.	Same time 1911.
March	6.54 $\frac{1}{2}$	5.81	7.39
March—April	6.54 $\frac{1}{2}$	5.81	7.38 $\frac{1}{2}$
April—May	6.54 $\frac{1}{2}$	5.81 $\frac{1}{2}$	7.39

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

THE general tone of the market during the week ending March 8th was steady, and with a few exceptions previous rates were maintained. Large supplies of Costa Rica were offered and met with a rather better demand, medium qualities being unchanged, while fine descriptions were bought by the Home trade and realized full to dearer prices. Other Central American kinds sold occasionally in buyers' favour, and Colombians were about steady. Dumont Santos was in little request and only a small proportion sold at lower prices. The stocks in the principal ports of Europe on March 1st, according to Messrs. Düüring and Zoon, showed an increase for the month of 176,000 bags against a decrease of 39,000 bags last year; the visible supplies showed a decrease of 710,000 bags against a decrease of 578,000 bags in 1912. The market for "futures" opened flat at a decline of nearly 1s., but a better tone has since been in evidence, and though rather under the best, the close was about steady at 54s. 7 $\frac{1}{2}$ d. per cwt. for September Santos. We quote :—

	To-day	Feb. 27th, 1913
London	54s. 7 $\frac{1}{2}$ d.	55s. 6d.
New York	12.50 cents	12.67 cents
Hamburg	61 $\frac{3}{4}$ pf.	62 $\frac{1}{2}$ pf.
Havre	75 $\frac{3}{4}$ francs	77 francs

The receipts at Rio and Santos from July 1st, 1912, to March 5th, 1913, were 10,142,000 bags, against 10,820,000 bags and 9,673,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India.—Coorg, 73s. to 74s. for smalls, 75s. to 76s. for second size, 77s. 6d. to 79s. 6d. for bold.

Uganda.—At 71s. to 73s. for smalls, 73s. 6d. to 76s. for second size, 77s. to 80s. for bold.

East African.—At 85s. for good bold.

Jamaica.—At 66s. 6d. for good ordinary palish country damaged.

Costa Rica.—At 71s. to 79s. 6d. for smalls, 74s. to 77s. 6d. for fine ordinary to low middling, 78s. 6d. to 85s. for middling to good middling, 78s. to 89s. 6d. for middling to fine bold.

Guatemala.—At 71s. to 74s. for fine ordinary to low middling, 76s. 6d. to 78s. for bold.

Nicaragua.—At 76s. per cwt.

Vera Paz.—At 74s. for smalls, 76s. 6d. to 79s. for low middling to middling, 82s. to 83s. 6d. for bold, 105s. for Maragogipe.

Colombian, &c.—At 73s. 6d. for smalls, 71s. to 76s. 6d. for good ordinary to middling, 76s. to 81s. 6d. for bold.

Dumont Santos.—Unwashed at 60s. for smalls, 64s. for medium, 65s. to 68s. 6d. for bold.

Sugar.

TRANSACTIONS with consumers were again on a fair scale during the week—reported Mr. C. Czarnikow on March 6th—and May prices further advanced from 10s. 0½d. to 10s. 2d., closing at 10s. 1½d., although Cuban receipts were fair (Guma 95,000 tons, Himely 108,000 tons), and though further two cargoes of Cuban sugar were reported between 10s. 4½d. and 10s. 6d. c.i.f. This is not dear compared with beet, which sold at 10s. 4½d. c.i.f., but Cubans are now held fractionally higher. In foreign white sugars, of which stocks are much reduced, we feel the absence of Russian and French offers; our refiners were again able to raise their prices, and holders may continue reserved until the spring sowings, so that the tone for the present remains rather confident, though various operators begin to prefer the cheaper new crop. It is expected that United Kingdom February deliveries will show a decrease of 15/20,000 tons, but this may be set down to buyers' policy of restricting duty payments before the Budget, and it will continue during the present month, when comparisons, however, may be less unfavourable, because the same tendency prevailed in this month last year. On the other hand the French Exchequer receipts point to a consumption of 57,000 against 50,000 tons. At the same time it is just possible that the period of large excess consumption and shipments may be toned down a little for a month or two; anyhow, we see no reason to alter statistical prospects in Europe.

The American prospective statistics are less interesting this season owing to liberal supplies of privileged sugars, but as each London fluctuation is supposed to reflect some change in Cuba or America, it would be interesting to study comparisons with previous years.

With a Cuban crop of 2¼ millions, and with an increase in New Orleans and Atlantic meltings of 130,000 tons, it seems that without any importation of Javas or European beet there will be more sugar available than ever before on October 1st in U.S.A. and Cuba, that is, unless Cuba exports considerably more than 80,000 tons to Europe and Canada.

The American market has continued to improve, and a considerable business was done at the advanced quotation of 3.54½ cents, which is now the spot quotation for Centrifugals = 10s. 1½d. c.i.f. New York, or 10s. 7½d. c.i.f. United Kingdom, basis 96 per cent.

In the United Kingdom arrivals of Cane Sugar are still upon a very small scale; values of refining grades are rather higher without bringing out offers of increased quantities. Grocery Crystallized at auction met a poor demand, and only partly sold at steady to rather easier rates.

As regards Cane-producing countries, the mail received from Brazil advises that, owing to unfavourable weather, the crop in Pernambuco will not reach 100,000 tons, as compared with the earlier estimate of 120,000 tons; a similar shortage will take place in Alagoas, Sergipe, and the State of Rio. In Bahia, which has usually had a surplus production, purchases of outside sugars have had to be made this year to supply local consumption. The West India mail reports that in Barbados the weather has been rather

dry, and prospects are less favourable than they were a few weeks ago. In Trinidad showery weather has prevailed, and delayed the commencement of grinding; on those estates that are already at work the juice is very poor. Later cables from Mauritius raise the estimate for next crop to 260,000 tons. In Louisiana rains affected the crop rather unfavourably last month, and dry, warm weather is wanted.

Sales include about 2,000 bags British West Indian, say, Crystallized Demerara, middling pale at 16s. 9d. to 17s. duty paid, middling yellow 17s. 3d., good middling to good yellow 17s. 6d. to 18s., fine ditto 18s. 4½d.; Syrups, good brown 12s. 3d., low yellow 13s. 3d. Crystallized Jamaica, middling yellow 17s. to 17s. 6d. Yellow Mauritius Crystallized sold at 18s. duty paid.

Coco-nut Products, &c.

FEBRUARY closed rather easier for palm oil, with but a slow demand. At the same period, report Messrs. Mordaunt Bros., sales of coco-nut oil also hung fire, because buyers and sellers were about 6d. apart in their ideas and seemed unable to come to terms. At that time Cochin was quoted at 44s., and Ceylon 42s. to 42s. 3d. c.i.f. A week later the palm oil market was firmer and sellers showed an inclination to hold; those that did so benefited, for by March 8th there was a steady demand, with a somewhat irregular—up to 2s. 6d. to 5s.—advance. Cochin coco-nut oil meanwhile remain firm at 44s. to 44s. 6d., and Ceylon 41s. 6d. to 42s. 6d. Prices on March 8th ran as follows:—

Palm oil (Liverpool):		1913	1912	1911
Per cwt.				
Lagos	... 32s. 3d. to 32s. 6d.	28s.	31s. 6d. to 32s.	
Benin	... 28s. 9d.	26s. 6d.	30s.	to 33s. 6d.
Congo	... 26s. 6d.	24s. 6d.	26s.	
Bleached	... 33s. 6d. to 34s. 6d.	31s.	34s.	
Clarified	... 29s. to 30s.	28s.	31s.	
Palm kernel oil	... 39s. 3d. to 39s. 6d.	34s. 6d. to 36s. 6d.	36s.	
Coco-nut oil:				
Cochin	... 47s.	43s.	to 44s.	45s. to 47s.
Ceylon	... 44s.	41s.	39s. 6d. to 40s.	
English pressed	38s. 3d.	34s. 6d. to 36s. 6d.	35s. 6d.	
Copra oil:				
Ceylon	... 42s. 3d. to 43s.	38s.	to 39s.	38s.
Cochin	... None	40s. 3d.	42s.	

According to the *Public Ledger* of March 13th, prices ruled as under (per ton):—

Soya Oil Beans steady. Parcels Harbin spot £8 8s. 9d. Hull, February-March, £8 7s. 6d.; July-August, £8 8s. 9d.

Linseed Cakes.—London-made, £8 to £8 2s. 6d.

Cotton Cakes.—London-made, £5 17s. 6d. to £6.

Copra firm. Manila, January-March, £28 10s. sellers; February-April, £28 1s. 3d. done; March-May sold at £27 15s. to £27 7s. 6d. to £27 10s., and April-June £26 17s. 6d. value. Cebu, March-April, £28 12s. 6d. sellers. Java, January-March, £29 3s. 9d. paid; February-April, £28 16s. 3d. value; and April-June, £27 18s. 9d. Northern Ports nett. South Sea Islands, January-March, £28 7s. 6d. sellers. Continent, January-March, £28 5s. sellers London. Malabar, March-April, £30 5s. value; Ceylon, January-March, £29 15s. sellers Northern Ports. F.M.S. Straits, January-March, £29 sellers Northern Ports. F.M. January-March, £28 15s. sellers; mixed, no

Padang, January-March, £28 5s. sellers; February-April, £27 17s. 6d. buyers; and Macassar, January-March, £28 15s. value c.f. and i., delivered weight.

Soya Oil.—London: Barrels spot London-make, £26 15s. Hull nominal: Naked crushed spot, £25 10s.; extracted, spot and to April, £23 10s. Oriental (in cases), February-March, £22 15s. c.i.f.; March-April, £22 12s. 6d. c.i.f. Antwerp.

Coco-nut Oil.—Ceylon spot, £44; February-March, £42 10s.; March-April, £42; March-May, £42 c.i.f. Cochin spot, £47; March £45; March-April, £44 15s.; April-May, £44 5s. c.i.f.

Palm Oil.—Lagos on spot, £35.

Palm Kernel Oil.—March, £40; April, £39 15s.; May-June, £39 10s. f.o.b. Hamburg.

The India-rubber Market.

By Messrs. FIGGIS AND SON.

At the sales held on the 25th and 26th ult., 668 tons Malay, 212 tons Ceylon, and 30 tons Java Plantation were offered. The opening prices showed an average decline of about 2d. per lb. against the previous sale's rubber rates. On the second day, with a good demand, prices recovered fully one halfpenny per lb., and the sales closed very firm at the top prices of the auction.

The February market closed quiet but steady, with Hard Fine, February-March and March-April done at 4s. 0½d.; April-May and May-June at 4s. 1d. At the close there were buyers rather than sellers at these prices. Soft Fine: No business reported, value 3s. 11d. per lb.

Negroheads.—Scrappy Manaos, 3s. sellers; Cametas, 2s. 2d.; Islands, 2s. 1½d. values.

The London rubber market was quiet up to the middle of March, with sales on the spot and forward at easier prices. About 950 tons Eastern Plantations kinds were offered and sold at the auctions on March 11th and 12th, with active competition, at an average decline from previous sales of about a penny per lb., against Fine Hard Pará, 3s. 11½d.; Caucho Ball, 3s. 0½d.

Sales included:—

Malaya.—737 tons all sold, say: Crêpe, fair to fine pale, dull to good palish, 3s. 10¾d. to 4s.; light brown and grey, part streaky, 3s. 10¼d. to 3s. 11¾d.; fair to good clean brown, 3s. 9d. to 3s. 11d.; dark and specky brown, 3s. 6¾d. to 3s. 9¾d.; dark and black, part pressed, 3s. 6d. to 3s. 8¾d.; dark and black, inferior, 3s. 1¼d. to 3s. 4d.; dark to good smoked, 3s. 6d. to 3s. 11¼d. Sheets, fair to very fine smoked (Highlands, 4s. 1¼d. to 4s. 1¾d.), 4s. to 4s. 1½d.; damp, mouldy, and part smoked, 3s. 10¼d. to 4s. 0¾d.; fair to fine unsmoked, 3s. 10¾d. to 3s. 11½d.; damp, mouldy, and stuck, 3s. 10d. to 3s. 11½d. Block, fine pale Lanadron, 4s. 3d. Scrap and Virgin, fair to good, 3s. 2d. to 3s. 4d.; mixed and inferior, 2s. 5½d. to 2s. 11½d. Rambong—Crêpe, 3s. 9d.; scrap and block, 3s. 8½d. Castilloa—sheet, 3s. 5½d.

Ceylon.—213 tons all sold, say: Crêpe, thick dull to fine, 3s. 10¾d. to 4s.; fair to fine pale, dull to good palish, 3s. 10¾d. to 4s.; light brown and grey, part streaky, 3s. 10¼d. to 3s. 11½d.; fair to good clean

brown, 3s. 9d. to 3s. 11d.; dark and specky brown, 3s. 7d. to 3s. 9¾d.; dark and black, part pressed, 3s. 5¼d. to 3s. 7¾d.; dark to good smoked, 3s. 9d. to 3s. 11d. Sheets, fair to good smoked, 4s. 0¼d. to 4s. 1¼d. Sheets and Biscuits, fair to good unsmoked, 3s. 10¾d. to 3s. 11½d.; damp, mouldy, and stuck, 3s. 10¾d. to 3s. 11½d. Scrap and Cuttings, fair to fine, 3s. 1½d. to 3s. 4¼d.; mixed and inferior, 2s. 3d. to 2s. 11d.

Mexican Plantation.—White blocked sheet, 3s. 5¾d. to 3s. 6½d.

Nyasaland.—Pressed reddish Crêpe, 3s. 5¼d.

Manihot.—Thick brown Crêpe, 3s. 6¾d. to 3s. 8¼d.

Up at Liverpool the Pará market has been easier during the week, and the demand has been dull. The sales will total about 130 tons, including hard fine spot 3s. 11d., March-April, 3s. 10½d. to 3s. 11d. to 3s. 10½d.; April-May, 4s. to 3s. 11¼d.; and May-June, 3s. 11¼d. to 3s. 11¾d. to 3s. 11½d. to 3s. 11¾d.; scrappy negroheads, 2s. 11¾d.; Caucho ball spot, 3s. 1d. to 3s.; and April-May, 3s. 0½d.; special coarse, 3s. 5d.; and weak fine, 3s. 8d. per lb. The demand for medium Brazilian grades continues to be limited, and values have become somewhat nominal. The African market, after opening steady, closes easier, with a moderate business passing, and the sales reported, which amount to 75 tons, include Conakry niggers, 3s. 6½d.; Conakry sheets and strings, 3s. 7½d. to 3s. 8d.; red Assinee niggers, 3s. 9½d. to 3s. 10d.; Loango ball, 2s. 9d.; Gold and/or Ivory Coast selected lump, 1s. 9d. to 1s. 8½d.; ditto rejections, 1s. 8¼d. to 1s. 8½d.; ditto pasty rejections, 1s. 8d.; Assinee cakes, 2s. 6d.; and Niger Gutta, 9½d. per lb.

Pará rubber statistics for the month of February (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará ...	3,790	1,190	= 4,980	agst 4,840	5,790	4,770
Shipments to Europe	1,970	810	= 2,780	„	2,490	2,620
„ America	1,570	220	= 1,790	„	2,640	1,500
					3,000	

Crop statistics, June 30th, 1912, to February 28th, 1913 (8 months).

	Pará.	Caucho.	1912-13.	1911-12.	1910-11.	1909-10.	1908-9.
Pará { 1912-13	24,200	4,970	29,170	25,710	25,700	26,970	26,280
Receipts { 1911-12	22,590	3,120					
„ Shipts. Europe	12,010	3,420					
„ „ America	12,380	1,810	14,190	13,470	9,840	14,020	13,090

What with political tension abroad, and labour troubles at home, the Rubber Share Market, in common with other departments of the Stock Exchange, was on the dull side at the beginning of March, report Messrs. Zorn and Leigh-Hunt. A further slight shrinkage in the price of the raw material has helped to keep down share quotations, but in spite of all adverse factors, the first of the “spring dividends” to be announced—viz., a final distribution of 100 per cent. (making 220 per cent. for the year) by the Batu Caves Company—has had considerable effect, Batu Caves shares moving up nearly £1 as a result. The dividend is 80 per cent. higher than that of the previous year, and at to-day's price (say, 14¾ cum dividend) the yield to an investor is 15 per cent. per annum; while in view of the fact that the crop for the current year is likely to be quite 450,000 lb., as against 370,558 lb. for 1912, the company's position, to put it mildly, does not afford any scope for grumbling.

The London Cocoa Market.

By THE EDITOR.

GENERALLY speaking the position of the cocoa market remains unchanged as the demand is as strong as ever, and at the moment it shows no signs of being satisfied. Trinidad, for instance, managed to increase from an export of 6,172 bags for the fortnight ending January 4th, 11,894 bags from January 4th to 18th, and 6,414 bags from January 18th to February 3rd, up to quite a respectable shipment, viz., 26,670 bags between February 3rd to 17th. The total export, however, from this island, is still far below buyers' requirements, being only 58,817 bags against 101,349 bags last year, and, as I expected, the large parcels that came into Port of Spain (Trinidad's capital and shipping port) only whetted and aggravated the appetites of shippers out there, who, if they had kept quiet when supplies were almost non-existent, caused quite an excited market in their endeavours to secure, each for their own customers, the cocoa as it came in from the country. The result was that prices jumped from 63s. 6d. to 66s. 6d. up to 69s. 6d. to 73s. (c.i.f. Havre) in the fortnight, and this tends to confirm the report that buyers are doubtful of such shipments, as 25,000 bags a fortnight, being prolonged; and yet, as I pointed out last month, such an output should be forthcoming to level up the 1913/14 crop to the end of March, and now to the end of April, even with last year's, and that turned out "no great shakes" in the end.

Then, again, although the shipments from the West Coast of Africa were not expected to exceed those of 1911, the market was disappointed when the final returns had been received and showed the two crops to have almost run neck to neck, 1912 being, in fact, behind. These returns showed my estimate of 22,000,000 lb. for December, given last month, to have been very close, the actual returns running as follows:—

		1912.	1911.
<i>Gold Coast Exports—</i>		lb.	lb.
January—November	...	67,375,856	70,591,477
December	...	21,829,807	18,890,749
Totals	...	89,205,663	89,482,226

Crossing over to San Thomé, we see that this island sent a heavy shipment for February to Lisbon, and so made up for her very small January export. According to Messrs. Martin, Weinstein and Co. the February movements were as follows:—

		Bags.
Lisbon stock at the end of January	...	73,725
Add landings in February...	...	80,201
	Makes	153,926
Less delivered in February	...	55,817
Leaves Stock on February 28th	...	98,109
Against ,, ,, ,, 1912	...	174,918

In the figures given below, it will be noticed that the stock in London, like Havre, is between 38,000 and 39,000 bags less than last year. Although I do not care to see prices maintained at too high a level, as tending to discourage consumption, the following table of stocks should be noted by buyers and shippers who profess to be so certain that prices will soon be 10s. to 15s. lower when heavy supplies come in. This, no

doubt, will be true when such supplies arrive and stocks run up, but meanwhile the present situation and immediate prospects run in the following lines:—

<i>Stocks at</i>	1913.	1912.
London, March 8th ...	75,002	113,801 bags
Liverpool, February 28th ...	3,805	5,970 "
Havre, February 28th...	163,084	201,614 "
Lisbon, February 28th ...	98,109	174,918 "
Comparative Totals ...	340,000	496,303 "

So much for immediately available supplies, including, of course, those in second and manufacturers' hands; as to future supplies, say up to June or September, what are we confronted with? Whilst buyers, as demonstrated by the local market in Trinidad, are anxious to cover future demands and replenish stocks, all the big centres, Guayaquil, Bahia, Trinidad, San Thomé, and Grenada, are behind, and show no certain signs of overwhelming the market with supplies to catch up with. The Gold Coast and San Domingo only marked time in 1912, compared with their crop for 1911, when stocks were heavier, and it remains for the Cameroons alone to show a large increase; the complete figures for last year are not yet published, but the Hamburg *Gordian* estimates that the output will be 4,600 tons (of 1,000 kilos), against 3,600 tons in 1911. Present prices are too high to encourage a big increase in the world's demand, but the above situation is not likely to bring any important and lasting drop in prices this side of June or July.

Here, therefore, likewise those looking for lower price have not gathered much comfort.

Coming to the question of stocks, these at the dates mentioned work out as under:—

<i>London Stock, March 8th—</i>		1913.	1912.
		Bags.	Bags.
Trinidads ...	...	3,067	5,737
Grenadas ...	...	4,679	12,890
Other W.I. ...	...	4,307	7,857
British Africa ...	...	10,585	14,035
Portuguese Africa...	...	6,186	7,244
German Africa ...	...	8,295	5,564
Ceylon and Java ...	...	15,753	10,322
Guayaquil ...	...	11,130	42,258
Brazil and Bahia ...	...	3,242	456
Other Foreign ...	...	7,758	7,438
Totals ...	...	75,002	113,801

<i>Havre Stock, February 28th—</i>		1913.	Value.	1912.	Value.
		Bags.	Fcs.	Bags.	Fcs.
Pará ...	...	11,846	87 to 90	10,718	74 to 77
Bahia ...	...	16,084	85 ,, 91	13,424	64 ,, 70
Venezuela ...	...	11,934	89 ,, 200	47,329	69 ,, 200
Trinidad ...	...	15,686	93 ,, 100	29,360	69 ,, 72
Grenada and other W.I.	...	1,724	82 ,, 92	4,916	64 ,, 71
San Thomé ...	...	4,112	89 ,, 91	8,729	67 ,, 69
San Domingo ...	...	8,653	75 ,, 81	6,096	62 ,, 66
Haiti ...	...	7,870	70 ,, 82	8,536	54 ,, 67
Accra ...	...	56,713	79 ,, 83	55,165	61 ,, 65
Guayaquil ...	...	21,435	85 ,, 92	11,900	66 ,, 74
Others ...	...	7,027	—	5,441	—
Totals ...	...	163,084 bags		201,614 bags	

The Board of Trade returns for the United Kingdom to the end of February again show a small increase over 1912 in the deliveries for Home consumption (2,186 tons against 1,800 tons in February, 1912). What is more remarkable is that for the first time for many months the landings and deliveries of foreign manufactured both show a slight decrease, say, 962 tons landed (against 1,054 last year) and 915 tons

delivered, against 1,085 tons in February, 1912. Here are the total figures for the two months:—

Raw Cocoa only—	Landed.	Del'd H.C.	Exported.	Stock (Feb. 28th)
Jan.-Feb. 1911—	8,531	3,957	1,068	13,280 tons
„ „ 1912—	10,103	4,314	870	14,556 „
„ „ 1913—	8,229	4,978	1,427	11,217 „
Decr. 1,874 Incr. 664 Incr. 557 Decr. 3,339 „				

One reason for the strength of the market of late has been offered by the demand of the commissariat department in Germany for war supplies, which is said to have increased the Germany deliveries for consumption in January some 50 per cent. above last year's figures to 6,700 tons. It will be remembered that during January-March last year Germany took 18,027 tons, against 15,500 in 1911 and 13,366 tons in 1910, so if she is going on at this rate, with the rather restricted supplies of raw material coming in, prices are not likely to go back. France, however, which seems equally bellicose at the moment—that is, on paper—shows no increase, but a reduction, say, 1,626 tons going into consumption, against 1,877 last year and 1,942 tons in 1911.

Including the sales of March 11th, present values (based on actual sales) work out as follows:—

Trinidads.—Good to fine good red marks are selling up to 80s. and 81s., whilst mid. red is valued at 75s. to 76s.; good mid. red is valued at 77s. to 79s.

Grenadas.—Fine touched 74s. at the end of February, but at the sales on March 11th did not go above 72s. (except for one lot, which realized 72s. 6d.), closing at 71s. to 71s. 6d., or 1s. down. Common unfermented to fair fermented sold up to 69s.

Dominicas during February sold up to 68s. and 68s. 6d. for good marks, and down to 60s. to 64s. for unfermented to fair reddish. On March 11th, fine realized 70s.

St. Lucias are selling up to 70s. and 71s., but should be worth 72s. compared with Grenadas. Common unfermented to good fair are worth 60s. to 66s.

Jamaicas.—Good marks sold at 64s. to 67s.; fine washed realized 70s. in February, and low unfermented to fair reddish at 59s. to 62s.

Costa Rica.—Good reddish sold on March 11th at 68s. to 71s.

Guayaquil.—Sales privately are reported at much higher prices compared with last month, including Arriba at 76s. to 80s., and Caraquez at 72s. to 74s.

Bahia.—Superior was bought in at 75s., but it has still to be seen whether the selling price will be 74s. or 72s.

East African.—Medium boldish sold at 75s. 6d.; good bold 78s.

British West African does not seem to be selling quite so freely, buyers objecting to present prices. Last sales up at Liverpool were at 61s. to 65s. 6d. Although the Havre stock of Accra kinds is not wonderfully above last year's, the deliveries were very small last month, viz., only 9,459 bags, against 14,827 bags last year, as compared with 41,182 bags landed, against 33,190 bags in February, 1912.

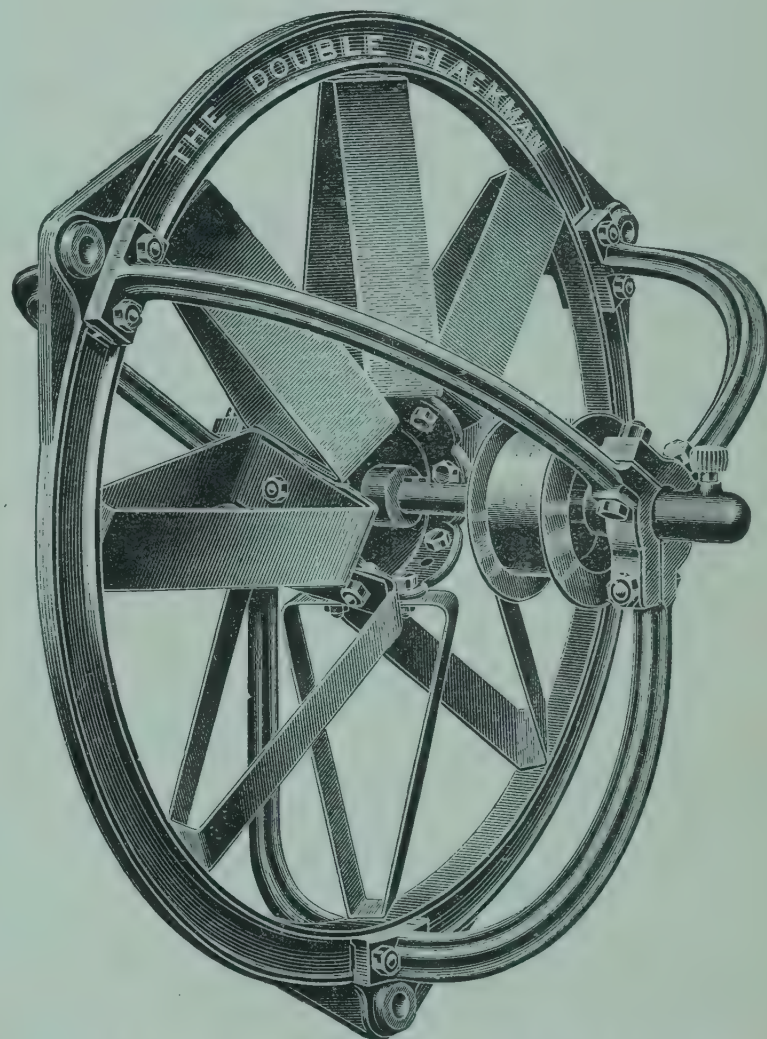
San Thomé.—Fine sold at 71s.

Ceylons.—Good bold has been selling at 79s. to 81s.; fair to good medium and bold, 76s. to 79s.; good native, 69s.

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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. IX.—No. 4.]

APRIL, 1913.

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Luncheon to Mr. F. W. Walker, Managing Director of Papuan Industries, Ltd.

OUR Editor had the pleasure of being present at the above luncheon given to Mr. Walker, who is over here, for the second time only in twenty-five years, to raise another £25,000 for the above industrial mission. As half the amount has already been obtained, we hope the balance will soon be forthcoming, for since their chief exports seem likely to be coco-nuts, makers of margarine, soap, &c., in which large quantities of coco-nut oil are used, should warmly support the work, especially as the money invested carries a 5 per cent. dividend. Among those present were the Right Hon. John W. Wilson, M.P., who presided, H.H. the Ranee of Sarawak, Mrs. Murray (the wife of the Hon. J. H. P. Murray, Administrator of Papua), Lord Lamington, T. Fisher Unwin (the publisher), and about 100 others. It had been hoped that the Secretary of State for the Colonies (Mr. Lewis Harcourt) would have been present, but this being impossible, he sent the following letter:—

"Had I been able to attend I might have found an opportunity of emphasizing the importance which I attach to the industrial and technical side of missionary work. It is, of course, necessary on occasion, that such work should be subject, at any rate in the case of undeveloped or recently administered territories, to the decision of the Government concerned as to the expediency or safety of operating in particular districts or as to the propriety of particular methods.

"Subject to these qualifications, I should be glad to see the missions embark on a more extensive programme of industrial and technical education of the natives. It is a commonplace that the native who gets education aspires to clerical or professional pursuits in which there are openings for a very limited number only. I should welcome any extension of educational effort which would divert the stream into the channel of production and the exploitation of the country's resources, and which would ensure an adequate supply of the agriculturists, mechanics, and artisans on whose presence the prosperity of a developing territory must ultimately depend."

THOSE who have followed our articles on "Farming by Dynamite" will no doubt be interested in the April number of *The India-Rubber World* of New York. In a leading article on the subject, our contemporary says (p. 342), "There are, undoubtedly, many readers of this journal, within our own borders, who will read with more than a merely general interest the paper on the use of dynamite on rubber plantations, which Mr. Hamel Smith, Editor of *TROPICAL LIFE*, contributed to the International Rubber Conference, recently held in New York, and which is reproduced in this number."

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Drying by the Acre—Part VII.

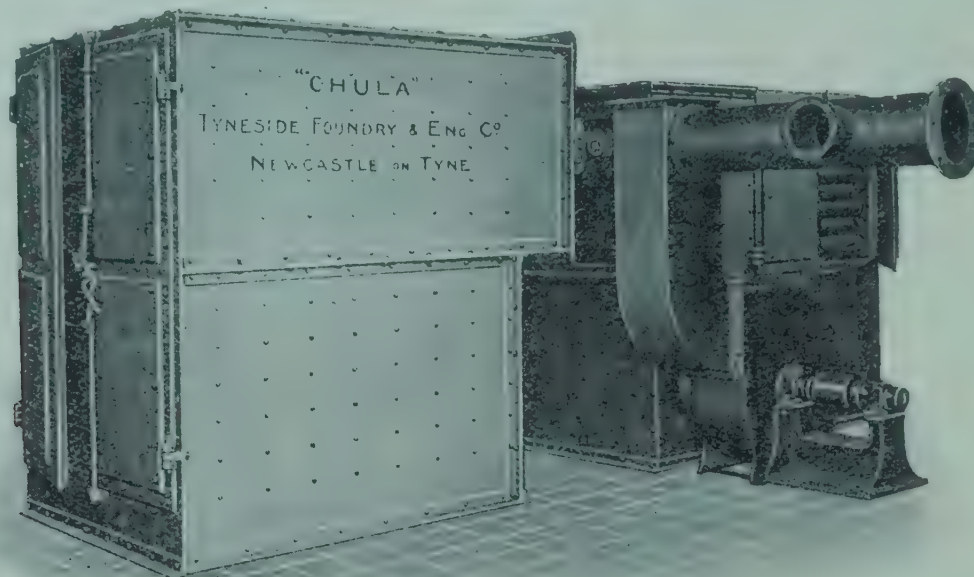
(Or Part IX, counting February and March (1912) as Parts I and II.)

THE "CHULA" DRYERS.

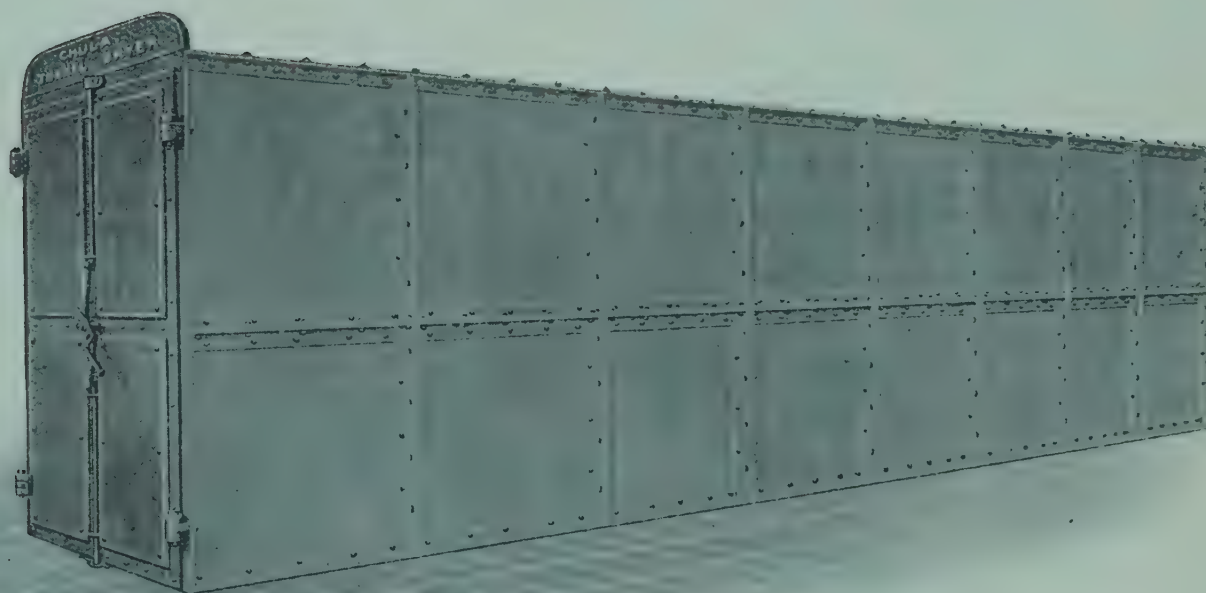
MESSRS. The Tyneside Foundry and Engineering Company, the manufacturers of the "Chula" tea and rubber drying machinery, have given a considerable amount of attention to the question of copra drying. In addition to their drying-room installation,

and swing doors are fitted to each end of the tunnel. The copra is spread on expanded metal trays, which are mounted in tiers on skeleton trucks, and passed through the tunnel during the drying process.

The "Chula" process is continuous, and as the trucks are light and run on roller bearings, they can be easily pushed to any part of the factory, so reducing the handling of the copra to a minimum. The trucks have guide rails where they pass through the tunnels only; elsewhere they run on the cement floor in any desired direction.



CHULA PATENT HOT AIR CHAMBER DRYER.



CHULA PATENT TUNNEL DRYER.

such as is used for curing rubber, and which is equally as suitable for copra, this firm now manufactures two types of self-contained dryers for copra.

The illustration immediately above shows the "Chula" patent tunnel dryer, which is suitable for large quantities of copra. This machine consists essentially of a long tunnel constructed of non-conducting steel and asbestos walls fitted to a steel framework. Hot dry air is delivered into this tunnel in a special manner from the patent "Chula" heater,

As a truck of dried copra is drawn out at one end of the tunnel a truck of fresh meat is ready for inserting at the other end. The truck of dried copra is allowed to cool off (the Tyneside Company have a special arrangement to facilitate this process), and then the contents are deposited in the "bagging" section of the factory, after which it is pushed to where the fresh nuts are being opened and there re-charged with "fresh meat" ready for inserting into the tunnel again.

These dryers are made with single and double tunnels, and the capacity of a single tunnel is approximately two tons of copra per twenty-four hours.

For fuel the coco-nut husks and shells can be used, or any other material available. If desired, the Tyne-side Company fit their patent liquid fuel attachment for crude oil fuel. The power required is approximately 2 h.p. per tunnel.

For those estates having small crops, this Company makes a smaller and cheaper dryer, known as the "Chula" patent hot air chamber dryer, which we illustrate herewith. This (the hot air chamber dryer) consists of two or more chambers made of steel and asbestos, each chamber containing a number of removable expanded metal trays on which the copra is to be spread. Hot dry air is delivered to these chambers under pressure from the patent "Chula" heater, and one such heater is arranged to work as many as four of these chambers, the addition of the extra chambers above the original two being a very simple matter, and the addition can be made at any time in order to cope with the increasing crop of nuts.

In both types of "Chula" copra dryers, the temperature is under perfect control, and the routine working is so simple and free from working parts and complications, that the machine can be left with safety in the hands of coolies.

We are informed that the Tyneside Foundry and Engineering Company are always pleased to show the actual machines at work in their factory to all intending purchasers, for which purpose a stock of coco-nuts is always kept on hand for demonstration. Those desiring to get into touch with them should write to the Secretary at Low Elswick, Newcastle-on-Tyne.

"Tropical Life" and the Establishment of Agricultural Colleges in the Tropics.

THANKS to the splendid support given to the above subject by the *Times*, the *Field*, the *West Indian Committee Circular*, the *Times of Ceylon*, *Nature*, and other journals, this question of higher agricultural education in the Tropics has become particularly prominent. We only wish, in order to get the matter more fully discussed, that the Ceylon Association in London had shown an interest in the matter equal to that of the West India Committee*, which not only reports the progress made by others, but sees to it that further progress is made on behalf of the claims of the West Indies for the first college to be established on their side of the world. The Tropics generally owe considerable thanks to Mr. Algernon E. Aspinall, Secretary of the West India Committee, and Editor of their *Circular* (a journal the same size as *TROPICAL LIFE*) for the way he has kept the matter to the front. Another friend, again entirely in the interests of the

West Indies, sprang up in the person of Mr. Cathcart Wason, M.P. for Orkney and Shetland, who on March 31st "asked the Secretary of State for the Colonies whether he was aware of the desire expressed in the West Indies for the establishment of a university of tropical agriculture for the purpose of teaching and research; and if he would give the proposal his most favourable consideration."

Mr. Harcourt in reply said, "I am aware that the question of providing facilities for training and for research work in tropical agriculture is attracting attention in the West Indies and elsewhere, and I need hardly state that any practical scheme that may secure adequate support will be assured of my sympathetic consideration. I do not, however, think that anything in the nature of a university would come within the scope of that description."

If no one up to now (April 14th) has written to urge the claims of Ceylon in the press, Mr. H. C. Sampson, of Trichinopoly, does not mean India to be overlooked, and his long letter in the *Times* of April 3rd, and that journal's leading article on the subject, need full consideration. As the part *TROPICAL LIFE* has taken throughout has been mentioned in the *Field*, the *Times*, and also, we believe, in official communications sent home on the subject, and as Mr. Sampson especially called attention to same, our Editor likewise addressed a letter to the *Times*, which appeared in their issue of April 14th. As the letter extended to nearly three-quarters of a column, we cannot, unfortunately, reproduce it in full, so must content ourselves with reprinting the concluding paragraphs:—

"As regards the claims of the East *v.* the West generally, I would sum the chief ones up as follows: The East can claim far larger sums already invested in tropical agricultural industries (and allied trades arising out of these), and especially that her still undeveloped lands and resources offer great inducements for further large sums to be invested out there. The West Indies, on the other hand, have been planted up by Europeans far longer than the East; they are more central and accessible, and can be reached by staff and students alike more quickly, easily, and cheaply than any suitable Eastern centre. This is a most important matter, for those engaged in the work would want to be moving backwards and forwards, for reasons of health, &c. Then again, conditions of soil, climate, rainfall, previous experience, &c., render it easier, I would maintain, to grow all the chief tropical crops within a comparatively restricted area in the West Indies, especially in Trinidad, than could be done in the East under circumstances equally healthy and accessible. For all this, I still maintain, let us first catch our hares—that is, let us raise the money; and having secured that, we can soon decide in which pot it will be best to cook them. I beg leave to take this opportunity to thank the *Times* for the support, suggestions, and help generally it has given on this important subject, and remain," &c.

For those who have only seen the original letter, we would point out that the fourth paragraph should read: "Ten per cent. of the cost of a Dreadnought would assure the success of three colleges, &c.," not, as printed, "The cost of a Dreadnought, &c." The mistake was due to the writer of the letter.

* We have since heard that it is proposed to form a committee in London to push the claims of Ceylon. This is very well in its way, but Ceylon's absence from the letters that have appeared in the press is to be regretted. Meanwhile the names mentioned in connection with the London Committee include neither Mr. Crosbie Roles nor Mr. Hutchison, of the *Times of Ceylon*, both of which gentlemen, we are quite sure, know more of the inner workings of the whole matter, as it has been fought out over here during the last twelve months, than any other Ceylon men on this side.

THE (1914) INTERNATIONAL RUBBER EXHIBITION.

AN INTERESTING TROPHY.

As stated in the inscription on the cup, the trophy illustrated was presented to Mr. A. Staines Manders, organizing manager, and Miss D. Fulton, secretary, by friends connected with the American rubber trade, as a token of appreciation of the benefits and increased trade it was felt that the third International Rubber and Allied Trades Exhibition, held last year at the Grand Central Palace, New York, would bring to the raw and manufactured rubber dealers and manufacturers in the United States. The fourth Inter-



national Show, to be held at the Agricultural Hall, London, in June, 1914, will do the same for those exhibiting at it; it is to be hoped, therefore, that the Exhibition will be well supported by the trade, both as regards the raw material and the manufactured and allied industries.

As we have already told our readers, the Exhibition and the Tropical Congress to be held next year is being organized for the purpose of displaying to visitors from all parts of the world, not only rubber, but all com-

mercial products grown in tropical or sub-tropical countries and exported to different places. Up to the present such a collective exhibit has been far too seldom brought together on mutual ground where manufacturers, dealers, &c., from all parts of the world can meet and examine them, and discuss supplies with the representatives of Governments, producers, &c., concerning them. England is a very convenient centre for such an exhibition, and June is the time of the year most convenient for representatives from producing countries to visit England; it is also a season when continental manufacturers and dealers find it easiest to visit this country and converse with producers from more distant parts. London is without doubt the proper meeting ground for the Congress of Tropical Agriculturalists that will be held during the Exhibition, and the attendance in 1914 will undoubtedly be exceedingly large. The Exhibition will be held under the auspices of the International Association of Tropical Agriculture, of which Professor Wyndham R. Dunstan, C.M.G., Director of the Imperial Institute, is the President.

As regards the various competitions and the trophies, prizes, &c., that will be offered, details of which will be published during the next few weeks, these will be of considerable value. Meanwhile we can give the following as a very incomplete list:—

THE PRESIDENT'S TROPHY.—(Particulars to be announced.)

THE "TROPICAL LIFE" MEDALS.—Gold Medal for the best sample of Cearà Rubber; Gold Medal for the best sample of Sisal Hemp; Gold Medal for the best sample of Coco-nut Fibre; Gold Medal for the best sample of Robusta Coffee; Gold Medal for the best sample of Copra; Gold Medal for the most efficient Hand Spraying Machine; Gold Medal for the most efficient Power Spraying Machine.

DIAMOND JUBILEE TROPHY.—(Open only to planters of Ceylon.) To commemorate the Diamond Jubilee of the Planters' Association of Ceylon.

RUBBER GROWERS' ASSOCIATION (LONDON).—It is anticipated that the Association will again arrange special competitions.

TROPHY PRESENTED BY L'ASSOCIATION DES PLANTEURS DE CAOUTCHOUC, ANTWERP.—(Conditions to be announced.)

"THE INDIA-RUBBER JOURNAL" (LONDON) TROPHY.—(Particulars to be announced.)

"GUMMI-ZEITUNG" (BERLIN) TROPHY.—(Particulars to be announced.)

"RUBBER WORLD" (LONDON) TROPHY.—(Particulars to be announced.)

"GRENIER'S RUBBER NEWS" (F.M.S.) TROPHY.—(Details to be announced.)

"INDIA-RUBBER WORLD" (NEW YORK) \$1,000 (ONE THOUSAND DOLLARS) TROPHY.—(Conditions to be announced.)

Those wishing to compete for any of the above should communicate with Mr. Staines Manders, at 75, Chancery Lane, London, W.C., without delay.

The Use of Cableways Extending.

CEYLON ASKS FOR THEM.

PART I.

IN our January issue we published an article showing how the use of cableways was tending to increase on all sides, and urging a further extension of this useful and comparatively inexpensive method of transport. Since doing so we have received the weekly edition of the *Times of Ceylon* of February 6, which we were pleased to see contained three long and influentially written articles urging the authorities to construct lines, the main reasons for doing so being to reduce the labour of hand transport, as a general labour-saving conveyance, and to relieve the island's transport system which seems to need being augmented to avoid the serious congestion that arises through insufficient road and rail conveyances.

We have so often claimed the well-known advantages of aerial ropeways that we rather demur at repeating them; still, we will state what others say, as they fully confirm what we have written on the subject. They state that this method of transport should be adopted on account of—

(1) Small initial cost compared with roads and bridges.

(2) Extreme simplicity in working.

(3) Ability to transport material in a direct line over precipitous ground, rivers, defiles, &c.

(4) Small consumption of power as compared with the tonnage transportable.

(5) Low cost of upkeep and depreciation.

(6) Great capacity for transport, as much as 40 tons each way per day of ten hours being handled on the type of line erected in Ceylon, and much more being possible if required.

(7) Small demand for labour for loading and receiving.

There are two distinct types of cableways, viz., the fixed rope system, and the moving one. The latter is the one employed throughout Ceylon, and is thoroughly suitable for the light loads usually handled here, and for almost all gradients met with.

An aerial ropeway of this type is, as a rule, constructed to carry loads of an average of 150 lb. each at intervals of one per minute, and at a speed of $3\frac{1}{2}$ to 4 miles per hour, but the frequency and weight of the loads can be largely increased. Such cableways will also meet the most ordinary requirements in Ceylon, such as breadth of span, steepness of gradient, though with gradients of over 1 in 2.5 special carriers may become necessary. As regards cost, the most economical type of line is one 3 to 4 miles in length over a regular succession of hills and valleys, and in proportion to the abundance of rivers, and bad ground that a cart road (or railway) would have to cross, the cableway becomes the more economical since it requires no bridges, no filling in, and no drainage or other costly work before the road proper can be prepared. Even where easy gradients and lack of obstacles make the cost of roads fairly cheap, the initial cost of the ropeway is unlikely to exceed that of the road; but even were it to do so, a distinct and permanent profit would be made on account of the labour-saving, and hence cheaper means of transport which would be provided for those having goods to send to and fro.

Coming now to the question of upkeep, the *Times of*

Ceylon correspondent goes fully into this also. Apart from the cost of loading and unloading, there should only be an occasional visit from a mechanic to shorten the cable, repair splices, &c., plus a small annual sum for renewal of hangers, wheels and bearings, and for paint, oil, grease, &c. Such upkeep will vary on different estates, or "ways," according to the tonnage passed over them, the care bestowed in using them, and on their upkeep whilst in use.

Coming to cable renewals, capital redemption, &c., sufficient money must be put by to meet these. It is sound practice to write off a sufficient sum to cover the cost of the entire way in twenty years. The cable, under exceptional wear or unfavourable conditions, may require to be renewed after the third year, but under ordinary circumstances it should last for six years. Great care and most favourable conditions could see a cable last for ten years, but to do so it is doubtful if it would be working at full pressure all the time. The Ceylon authority estimates the cost of cable renewal at about Rs. 2,700 to Rs. 3,000 (£180 to £200) per mile between terminals, erected and running.

The labour required to work the line is bound to vary on account of the gradients, the length of the line, the number of angles, &c.; on an ordinary straight line driven from a factory shaft the following staff is required (in Ceylon):—

(1) For each intermediate loading station from which loading is in progress, two coolies.

(2) For each terminal, two coolies, but possibly more if traffic is heavy.

(3) For patrolling the line, one coolie.

As, however, such a line will transport 40 tons a day each way, even if above numbers have to be increased the saving in wages and cost of transport generally must be substantial when one thinks of the number of coolies it would take to transport 80 tons of stuff by other means. Both in upkeep and cost of transport, therefore, cableways seem able to show a great advantage over cart roads, and added to this there is the saving in the value of the land that cart roads or railways occupy, plus the cost and upkeep of the cattle, the carts, and their drivers.

"From the very commencement of my term of office," reported Sir Henry McCallum, then Governor of Ceylon, in his "Review of the Administration of Ceylon for the Years 1907-13," "I have been impressed by the difficulties of road transport in Ceylon. These difficulties, which are of course greatly accentuated in the hill districts, have for the past few years been immeasurably increased by the unfortunate recrudescence of rinderpest in epidemic form. Transport by bullock cart is at the best a slow and unsatisfactory process, but when there is added the wholesale death or slaughter of draft cattle and the restriction of traffic between one district and another the situation becomes one of considerable gravity." To show that the matter is still a burning one we need only add that as recently as March 8th last a joint deputation of the Planters' Association of Ceylon and the Chamber of Commerce waited on His Excellency the Acting Governor at Queen's House, by appointment to represent to His Excellency the difficulties of road transport at present experienced in Ceylon, which have formed the subject of some luminous speeches at the recent annual meeting of the Planters' Association of Ceylon.

INDIAN TEA ASSOCIATION NOTES.

Proposed Adoption of Labour Bureaux by the Indian Tea Association.

IT will be remembered that in our issue for December, 1910, we strongly urged that steps be taken to establish an Imperial Labour Bureau, with branches in India, Ceylon, and other important centres, to organize and regulate the ebb and flow of labourers needed for the estates. We discussed the matter more fully as regards India in the paper we read before the London Rubber Congress for 1911, and we feel that ultimately not only an Imperial but even International Labour Bureaux will have to be arranged to avoid disputes and ill-feelings between planters at rival centres on the one hand, to refuse supplies from places where the labour is needed, but to encourage labourers to move from congested centres where there is a surplus population to others where assistance is required. Such bureaux would also reduce inter-plantation disputes over crimping cases, and would materially reduce the present cost of recruiting by means of kanganyes.

We were, therefore, pleased to see that at the annual meeting of the Indian Tea Association Mr. G. Kingsley, the chairman, referred to the labour controversy that has been raging of late, and stated that the past year would be chiefly remembered as having seen the tea industry of this country (India) express a more or less unanimous opinion on the great labour question. "In the bureau scheme," the chairman went on to say (we are quoting from the *Madras Mail*), "the idea is to create the machinery for supervising recruiting. The bureau would take no active part in recruiting, and not have anything to do with the distribution of labour. There would be no monopoly. It would be open to any concern to recruit through one of the existing associations or to make its own arrangements in the recruiting districts. It would be the duty of the bureau to see that all recruiting was carried on in a legitimate manner. It would, in fact, mean co-operation by proprietors with the Government to put down abuses which now exist. If we do this I feel confident the Government will do all in its power to assist us. We ought, in my opinion, to drop the attitude which has been taken in the past, and which many are inclined to take up to-day, *i.e.*, that it is the duty of the Government to stop abuses. If we persist in this attitude it can only lead to prohibitive legislation, which must adversely affect all recruiting. After all, when one comes to analyse the position, who are the offenders? Why, the proprietors themselves. In these circumstances it must be obvious to anyone that it is absurd to say to the Government, give us greater freedom for our sirdars recruiting, and in the next breath to ask for legislation to stop abuses which we ourselves countenance. Speaking with considerable knowledge of the subject, I say there are only two courses open: (1) co-operation on the part of proprietors, or (2) prohibitive legislation by the Government of India. The first, at any rate, holds out some hope of success, while the latter spells disaster. The bureau scheme is now being considered by the Government of India, and if it is pronounced feasible I hope everyone connected with the industry will see the necessity of giving it a fair trial."

In face of this, we can look forward to seeing our ideas carried out in practice, at least in India. We hope this

will be so, for we feel, once an example is made, our centres and other countries will co-operate together to the benefit of both employers and employed—India, Ceylon, Java, China, Borneo, Malaya, &c., in the East, Africa, Latin America, Australia, and the South Sea Islands elsewhere. At all these centres the labour question would benefit by a discussion between international representatives, not only to settle immediate requirements, but, what is more important and pressing, to arrange for the more urgent and ever-increasing needs of the none too distant future.

We understand from our exchanges that a number of Jats of the Ferozepore district, India, who had the enterprize to try their luck in Argentina, have failed to secure employment, and so been reduced to a state of great distress, Indian labour not being viewed with favour in this Latin-American Republic. With the demand for labour in Ceylon and Malaya it certainly seems a pity that East Indians of such a class as these Jats should have been persuaded to go where they were not wanted, whilst nearer home their services would have been welcomed.

We do not believe, says the *Indian Planters' Gazette*, that the quantity and value of the exports of tea seed from India are realized by the planting community, whose throats, we are told, are simply being cut by the trade. The above statements show that the exports each season are increasing. A large quantity of our best tea seed has been exported to Java. It is no wonder that the teas of that country are becoming a powerful competitor of British grown teas in the London market. They have most certainly ousted China teas. They will, of course, never succeed in ousting British grown teas, but they will help to keep prices of common teas down.

The same paper discusses the question raised by Messrs. Brooke Bond and Co. and Messrs. McMeekin and Co., as to whether the use of tea was being affected by the growing use of cacao, and figures are given to show that the consumption of cacao has increased from 56,709,000 lb. in 1908 to 85,747,000 lb. in 1912.

This increase is considered to have been immense; those who have read our monthly "Cocoa Market Report" will realize, however, that, compared with Germany and America, the increased consumption of cacao in the United Kingdom is by no means as large as it should be. If tea does not show the same ratio of increase it is only because the public have always been great tea drinkers. Except in two or three well-known cases, adds the *Indian Planters' Gazette* with truth, tea does not require to be puffed and pushed into notice; it seems to sell itself.

Much has been said of the use of explosives on the farm, and recently some interesting facts have been brought to light regarding the use of dynamite on tea estates. The underlying principles are precisely the same as if the explosives were used for ordinary agricultural work. The use of dynamite in agriculture is now coming to be recognized as an important factor, and that the time is not far distant when it will be largely adopted on tea, rubber and other plantations is the opinion of Mr. R. N. Lyne, Director of Agriculture, who was interviewed on the question by the Kandy representative of the *Times of Ceylon*.

Mr. W. P. O. Macqueen, the Representative of Nobel's Explosives Company, Ltd., in India, carried out some experiments in various parts of India before large

audiences, composed mostly of tea planters. The results in every case were most satisfactory, and the efficiency of the methods was generally admitted by all present.

The actual effect upon the tea estates cannot of course be known for some time, but experimental explosions show that the "hard pan" can be broken up in India in such a manner that the efficient drainage of the land is assured, and in face of Mr. Lyne's remarks in Ceylon, that island should also take kindly to "farming by dynamite," both on some tea lands as well as in the Dry Zone districts, as the one 13 miles south of Dambool, where a recent flotation (The Murchison Associated, Ltd.) has gone in for Ceará planting on an extensive scale.

In some tea districts the existence of hard pan has been regarded as a misfortune that had, of necessity, to be accepted. All this, however, will now be a thing of the past; and the planter can so treat the most impermeable soil as to derive the greatest possible benefit from it. The idea of sub-soiling with dynamite, Mr. Lyne pointed out, was not to disturb the top soil but to break up the hard pan effectively. The cartridges were inserted at the required depth and fired; and while there was not much movement on the top, the soil below was broken up for some distance all round. The harder the ground the more effective the explosion owing to the resistance offered, while in loose soil it was practically useless.

"The effect of dynamite in soil, it must be remembered," he added, "is in inverse ratio to the amount of earth thrown up." The hard ground through which the rootlets of trees penetrated with the greatest difficulty and which supplied no nourishment, Mr. Lyne went on to say, was broken up all round, cracks and fissures radiating from the centre of the explosion. Moisture would now be conserved, and the plant rootlets would have no difficulty in receiving new nourishment which would develop the growing plant in a remarkable manner. Storm water, instead of running off the land, would sink into the cracks and fissures in the soil and be conserved and prove invaluable to the plants in the hot season.

Experiments will shortly be made at Aligarh to test the value of dynamite in the reclamation of *usar* land. There is a large area of this kind of land in the Western Districts which is useless for cultivation owing to the excess of sodium carbonate it contains.

Demand in London for Indian teas has again been good, and the sales to April 17th passed with a brisk and further improved tone, prices frequently moving in favour of sellers. Competition was particularly keen for all good liquoring parcels, and also for teas with a good show of tip, for which full prices were obtained. Medium kinds fully maintained their previous level of value, and an occasional advance for teas between 8d. and 9d. per lb. was recorded. Common kinds remained about steady, though a little irregular tendency was sometimes noticeable. The average for the whole sale on garden account is 8½d. per lb., compared with 8¾d. per lb. a year ago.

With Ceylons the market generally was firm to a trifle firmer, bidding was brisk and well distributed. Quality is variable, but more teas are to be found showing improvement than the reverse. The strongest demand was for medium to good teas—leaf and broken—between, say, 8½d. and 10d.; these were wanted and frequently sold at ¼d. advance on last prices. Low teas showed no change, but buyers were not particularly anxious about them. The average for the whole sale on garden account is 9½d. per lb., compared with 9d. per lb. a year ago.

Hevea Rubber in Indo-China.

By M. N. LE COISPELLIER.

Hon. President of l'Association des Planteurs de Caoutchouc de l'Indo-Chine.

FOR about the last fifteen years the wild rubber vines growing in the forests of Haut-Laos and Tonkin have been exploited and worked by the natives, and the rubber produced sold to European firms at Saigon or Tonkin, for export to Europe; but it was not until 1898, that any hevea was to be found in Indo-China. In that year some stumps were brought out to the colony by M. Raoul, the Government chemist, who collected them in the Federated Malay States, through which he had been commissioned to travel.

Some of the stumps were planted at the Saigon Botanical Gardens, whilst others were given out to and planted in private estates in the provinces of Baria, Bienhoa and Thudaumot. Of those in the Botanical Gardens the growth has all along been very slow, probably on account of the poor soil; but elsewhere, especially in Baria and Bienhoa, the results have been fairly good.

About 1900, M. Belland, a planter, started planting hevea with coffee on his property at "Phu-Nhuan," in the province of Giadinh, close to Saigon; to do this he specially imported the stumps from Singapore.

These trees made satisfactory growth, and towards 1905, when the establishing of rubber plantations in the Middle East was first freely discussed, M. Belland, who had become dissatisfied with his coffee, cut them out, and devoted his land and time entirely to hevea, and in 1908, the "Phu-Nhuan" estate exported its first shipment of rubber, which, not unnaturally, was consigned to France.

Meanwhile Dr. Yersin, of the Pasteur Institute at Nhatrang (Annam) had established the small estate of "Suoi-Giao," where he carried out experimental cultivations of hevea, of tapping the trees, and treating the latex. It was about the same time that the Cochinchina Agricultural Department established an experimental garden or "Plantation d'Essais," at Ong-Yem.

As an outcome of these trial plantations promising to ultimately become successful, coupled with the attention that had been drawn to the now famous rubber estates in the Straits Settlements, the Federated Malay States, and Java, planters commenced to establish estates in various parts of Cochinchina as well. Until 1906, however, the rich soils known as the "terres rouges" which lie east, between Saigon and the mountains of Annam, remained untouched; indeed, until the railway, Le Trans-Indo-Chinois, was built, this important area, covered with virgin forests, was almost unknown.

In that year (1906) M. Girard, now Chairman of the Agricultural Board of Cochinchina, who, with his friends, secured a concession of lands in the "terres rouges" district, about forty miles east of Saigon, and quite close to the railway, cleared the land, and planted some thousands of stumps (hevea). These did so well that, at the beginning of 1907, the "Société Agricole de Suzannah" was founded in order to plant up the bulk of the concession possessed by the syndicate, which covered some 7,500 acres, with hevea. Their example was soon followed by others, and, from 1907, the area planted up in rubber, both in the grey as well as in the red soils, has increased more and more. In

the May (1911) issue of the *Annales des Planteurs de Caoutchouc de l'Indo-Chine*, specially devoted to that year's London Rubber Exhibition, a list was included of all the rubber estates that were in existence in Indo-China on January 1 of that year. Since then, however, many other plantations have been formed, until to-day there must be some ten million trees throughout Indo-China. This, at 200 trees to the acre, would mean about 50,000 acres planted since 1898 with hevea rubber. Of these one or two only are some fourteen years old, a good many five to ten years, whilst the remainder have been established for five years or less. Indo-Cochin-China, therefore, some years ago arrived at the producing stage to a small degree, and will soon be exporting quite a substantial quantity of rubber.

This causes one to ask, what are the prospects of Indo-China as a rubber producer?

Fears have been expressed that the dry season, which, in Cochin-China, lasts at least four months, would have proved a serious obstacle as regards successful rubber-planting, although the actual rainfall registered in the course of the twelve months might be equal to that of the Amazon Valley. As regards this, the opinion expressed by Mr. H. N. Ridley, ex-Director of the Botanical Gardens at Singapore, and father of the rubber-planting industry in Malaya, is worth noting, for as an authority on the industry and the climatic conditions, especially in the East, he is well known, and his opinion beyond dispute.

Mr. Ridley visited Cochin-China in November, 1911, and inspected many rubber plantations in that colony, and the following is an extract from his remarks to the Rubber Planters' Association whilst in Saigon concerning his visit:—

"In the red soil there is only a very small difference between Cochin China and Malaya in the time taken for the hevea trees to arrive at a tappable age. In Cochin-China the annual growth as recorded is excellent, and at times even exceeds that shown in the records published by the *Straits Bulletin*. The vegetation is very active in the red grounds between the second and third year after planting the stumps. In the grey soils, *i.e.*, the alluvia in the low-lying lands, the rate of growth, which is very active in the first and second year after planting the stumps, seems to slacken afterwards."

From this Mr. Ridley thinks that, if the heveas in red soils could be tapped at four and a-half years of age, those on the grey soils should be equally advanced at five and a-half years. He added this remark, however, that tends to place those trees in the grey soil in a more favourable light, *viz.*: As regards the measurements taken, and which he can verify, he must be less explicit with the grey soils as a whole, because, except the Phu-Nhuan estate, none of the trees that he had seen planted in grey soils were old enough to allow him to form a reliable opinion as to the average growth of trees in such soils. To this, I can further say that none of the estates visited by Mr. Ridley had been clean-weeded, except for a two-yard space around the trunks, which alone was being kept clear of growth. The trees were planted 148 to the acre.

Every centre has its advantages, as well as its drawbacks, and if the four months' spell of dry weather may be a drawback in tending to keep back the growth of hevea trees in Cochin-China, as compared with that of Malaya, the period of rest has certainly the advantage

of preserving the trees from the pests to be found in the Middle East, and Mr. Ridley, throughout his visit, found no traces of cryptogamic pests (mosses, lichens, &c.), and has also been able to confirm the statement that drains are not needed on Cochin-China estates. These advantages alone reduce the cost of production in wages paid, or from trees lost, to a considerable extent compared with some, and probably many, Malayan estates. Meanwhile, all agree that as a producing centre, Indo-Cochin-China has proved perfectly satisfactory, both as regards the methods employed and the growth and yield of the trees on the estates.

Then arises the question as to whether the rubber produced in Indo-China is of good quality. To this an answer in the affirmative, based on facts that nobody can deny, is easy to give.

Since 1908 the plantations of Ong-Yem (Cochin-China Government Station) and of "Suoi-Giao" (Pasteur Institute of Nhatrang, Annam) have exported to France biscuit and sheet rubber, which has been much appreciated.

In 1909 the "Phu-Nhuan Estate" (M. Belland's Plantation) sent sheet and scrap rubber to Paris, which sold very well, even when one takes into consideration that they arrived just at the boom when all rubbers obtained high prices.

The following also shows that the rubber from Indo-China is well prepared and of good quality. In August, 1910, the delegates from the Rubber Planters' Association of Cochin-China to the Agri-Horticultural Show of Singapore were able to show sheet rubber from the Ong-Yem Estate, and sheet and scrap from Phu-Nhuan, all of which were "highly commended" by the judges.

Again, at the London (1911) Rubber Exhibition, M. Crémazy, then Chairman of the Agricultural Board of Cochin-China, and delegate for that colony, gave Mr. Staines Manders samples of sheet rubber prepared on the Government Plantation of Ong-Yem, and asked him to have them valued and reported on in the same way as the rubber entered for competition for the *India-Rubber Journal*, "Grenier's" and other prizes, had been.

Mr. Manders' report showed that as regards nerve, breaking strain, tensile strength, &c., the rubber was extremely good, and had it been entered for competition for the *India-Rubber Journal* prize it would have obtained 89.5 marks out of a possible 100, or less than seven marks below Sungei Kapar, which carried off the prize. The trials, as regards vulcanization, were also extremely satisfactory.

To further prove that rubber so satisfactory in quality is not only turned out by one or two estates, or by the experimental station, I would point out that since the (1911) London Exhibition estates other than "Phu-Nhuan" have come into bearing, particularly those of "Suzannah" and "Xa-Trach," the rubber from which was inspected by Mr. H. N. Ridley when travelling through Cochin-China, and described by him as being very good. These reports have been further confirmed, since Mr. Ridley's visit, by the rubber from "Suzannah" and "Xa-Trach" Estates, which has been shipped regularly to France, where samples were given out to one or two of the principal manufacturers, and which, in each case, were reported to be perfectly satisfactory in every way. All this tends to show that Indo-China is going the correct way to obtain the right to be reckoned on as a coming rubber-producing centre.

Economic Zoology.

Our Motto: "Utilization, not Extermination."

Conducted by FRANK FINN, B.A., Hon. F.Z.S.

COCO-NUT ESTATES AND ARMY REMOUNTS.

REFERRING to the article in our July issue, "Remounts for the Army," in which we urge owners to seriously consider the possibility of breeding horses suitable for Army remounts on large coco-nut estates, we see by the *Tropical Agriculturist* that the Ceylon Government is about to start a horse-breeding farm in the neighbourhood of Ambepussa railway station. This establishment, adds our contemporary, should offer immense facilities for such work as has been indicated above. Mr. A. L. Hutchison, London correspondent to the *Times of Ceylon*, in commenting on, and supporting our suggestion, called attention to the success of the pony-breeding establishments on the island of Delft, off Ceylon. "My pony, 'The Birdcatcher,' (14.2)" he goes on to say, "which once had a great reputation in Haputale, was a Delft pony. He was hard to beat in the matter of stamina, and there was simply no tiring him. He was an Arab, and as the late 'Skip' Shelton used to say of him, he was 'a perfect miniature charger.' Something heavier and more of a weight-carrier could doubtless be bred."

This reminds us that the advice we give in our book on "Coco-nuts," as well as in the columns of this paper, urging estate owners and land proprietors to take up cattle-breeding, sheep-farming, and hog-raising, so far as their means will allow, was given none too soon. On every side we are constantly hearing complaints of the shortage of food supplies, particularly of meat. Berlin had what almost amounted to a riot, owing to the high prices demanded, whilst even Switzerland, we believe, is importing Argentine cattle. In the United States, here in England, and elsewhere, the rise in the cost of meat and other food-stuffs is eating a big hole in the increased wages of the public; so much so that much as wage-payers are already complaining, it seems unlikely that the present level of wages has anything like touched its highest. All this naturally affects the cost of machinery and manufactured goods sent by the meat-buying countries to the Tropics. If, therefore, estate owners can see their way to increase the world's meat supply, they will not only benefit the public generally, but, by lowering the cost of living, or at least by helping to discourage its going still higher, they will benefit themselves in more ways than one.

The Ceylon papers, some time back, in speaking of the scarcity of meat, reported that at Matale prices showed a rise of 120 per cent. on November 12th, for on that day there was only one ox available to supply eighty planters and their families on the estates, as well as the general public in the town. We feel that, in face of such news, one and all of our readers who can do so, will at once begin to seriously consider the rearing of cattle and other stock for supplying their meat to those requiring it, in the same enthusiastic and practical manner that they have done and are doing with the planting of rubber and coco-nut palms for their produce.

Meanwhile, with regard to the supply of remounts for the British Army, matters do not mend. Mr. Walter Runciman, M.P., President of the Board of Agriculture,

speaking at the conclusion of the Van Horse Parade held annually on Easter Monday in Regent's Park (London), told his hearers that a year ago a Government publication put the deficiency of young horses at 200,000, and then he added: "*It is vastly greater to-day.*"

Colonel Seely, M.P., Secretary for War, who also spoke, owned that it was a fact that the Government was faced with a great difficulty. The number of horses available for peace times did not come up to the requirements of traction in war times.

Meanwhile, as the *Daily Mail* reminds us, the horse-breeding season starts about the end of March, and the present one promises to be much the most disastrous known. Small farmers have quite given up horse-breeding. The English Government, unlike the German and French and Austrian Governments, has done nothing to remedy the defect. Unless something is done the transition period, which Colonel Seely mentioned in his speech, will end in the extinction of the British war horse. The horses bred under the development grant scheme go for the most part abroad.

We feel justified, therefore, in again calling attention to our article, published in July, 1912, on "Remounts for the British Army: Can they be raised on Coco-nut Estates?" In face of the above statements, made by the highest authorities, the question of raising remounts in the Colonies should not be allowed to rest.

According to the *Journal of the Board of Agriculture* (England), it was clear that when coco-nut poonac was fed to cattle the butter made from their milk was much firmer; those, therefore, making butter in warm countries may find coco-nut cake of considerable advantage as a feed. These experiments were carried out at Wye Agricultural College. We should be interested to know how similar experiments carried out with poonac fresh from the press, if fed to cattle on the coco-nut estate itself, would compare with above. Speaking of this reminds us that cream separators are now seen working in many big cities in India. They make a large quantity of separated milk available for use. Fuller particulars of the above will be found in the January *Journal of the Agricultural Institute*, Pusa, India.

According to the *Indian Trade Journal*, Mr. Ledgard President of the Bengal Chamber of Commerce, in addressing the members at their annual meeting, referred to wool and sheep-breeding, pointing out that prices for wool had been advancing all over the world continuously since 1908, and India had kept pace with the advance, and the period of dear wool was not likely to be ended. The Indian Government had under consideration the necessity of endeavouring to improve the breed of sheep on the plains of these provinces, and some rams were imported from a part of Australia the climatic conditions of which closely resembled those of this part of India. Breeding operations were going on, and an improvement in carcasses and wool was fully anticipated.

Experiments show that, so far as soya and cotton cake are concerned when feeding dairy cows in England, the one can be safely used as a substitute in a ration for the other. Although the results obtained were nearly equal for the two cakes, yet what slight advantage there was showed that soya cake was slightly better for milch cows than decorticated cotton cake, which is slightly richer in oil, while the soya cake is slightly richer in flesh producers.



"Tropical Life" Friend.—No. 94.

J. DEKKER, PH.D.

Director of the Colonial Museum at Haarlem.

READERS of TROPICAL LIFE will remember the name of Dr. Dekker in connection with our prize essay on the "Fermentation of Cacao," as he acted as judge for Messrs. J. H. de Bussy, of Amsterdam, and our friends in Holland and Germany. His position as director of the Colonial Museum at Haarlem, and his previous reputation as a tropical expert, which led to his being chosen to succeed the late Dr. Greshoff to that position, has placed "Our Friend" this month in the forefront of authorities on economic botany in the Tropics.

Born at Alkmaar, in Holland, on June 6th, 1879, Dr. Dekker, after studying pharmacy and natural philosophy, first at Utrecht, and then in Switzerland at Bern, entered the laboratory of the same museum of which he is now director, and studied there under the guidance of Dr. Greshoff. In 1902 he gained the degree of Ph.D. (*summa cum laude*, i.e., with honours) with his thesis "Ueber einige Bestandteile des Kakao und ihre Bestimmung" (On the chemical composition and analysis of cacao).

The close of the year 1902 found Dr. Dekker in the Dutch East Indies, acting as military chemist and dispenser at Batavia, after which he spent two years at Atchin, in Northern Sumatra, before he returned home, and put in some more work at the Colonial Museum, specializing in experimental and historical study on tanning materials. The results of this work are published as Bulletins 35 and 39 of the Colonial Museum, 1906 and 1908, which publications include the doctor's monograph on "Tannins." For another essay, that on the tannin of Mallet Bark, i.e., the bark of *Eucalyptus occidentalis*, "Our Friend" was awarded the gold medal of the "Hollandsche Maatschappij van Weten-

schappen," an institution, we believe, somewhat similar to our Royal Society.

Dr. Dekker returned to Java in 1907, and soon after his arrival there was commissioned to investigate and report upon the influence that certain feeding-stuffs and fodder had upon a disease *osteo-malacia* which, at the time, was very prevalent among the army horses. The results of these investigations were published in "Mededeelingen, uitgaande van het Departement van Landbouw te Buitenzorg" under the title of "Voeder-Stoffen" (Feeding-stuffs, a Monograph on the Fodder in Dutch-East-Indies).

At Buitenzorg "Our Friend" was in charge of a new department, i.e., the "Bureau voor Landbouw- und Handelsanalyses," known to-day as the "Handels Laboratorium" (Commercial Laboratories), and remained out there interested in this work until August, 1910, when he left for Europe to take up his present post, rendered vacant by the death of Dr. Greshoff, whose loss everyone regretted. Such an appointment carries a lot of prestige with it, and this will be further increased in all ways before very long, when the entire department will be removed to Amsterdam, and its influence and work extended and increased in many ways.

Certainly it has been satisfactory, not only to the trustees of the Institution, and to those who have come into contact with "Our Friend," although the task of filling Dr. Greshoff's place is no light one, and when the Institute is removed to Amsterdam, the work will be greatly increased. At the time of Dr. Greshoff's death, the plans for its removal were developing under Mr. J. T. Cremer, ex-Minister for the Colonies as Hon. President, and Dr. H. F. R. Hubrecht, M.P., and a large sum of money, about 1½ million guilders (guilder = 1s. 8d.), has already been subscribed by private individuals to further the object.

Thanks to this, Amsterdam will in a few years possess a Colonial Institute worthy of the colonizing fame and glory of this small, but enterprising and pugnacious (at any rate in the past, and no doubt to-day, if occasion arises) country which the ancestors of the present generation wrung from Spain at the cost of so much blood and misery, under the bigot Phillip II., and the relentless Alva, who is said to have caused 18,000 people to have been executed in the Netherlands, to which Haarlem contributed 2,000, besides those who died fighting. The marvel is that the Dutch ever had the courage and nerve to continue the uneven fight until they gained the ascendancy, and their former oppressors fell from power in many ways.

In these more peaceful days, the Colonial Institute will not only carry out the work of the present institution, but will also establish separate, special departments for ethnology and tropical diseases, which will receive particular attention.

Agricultural and commercial expansion in the Dutch colonies, and elsewhere, where Dutch capital is invested, has of course, greatly increased the work of the Director of the Colonial Museum and his staff. In spite of this, Dr. Dekker still finds time to contribute articles in the *Indische Mercur*, and other leading publications. He has, we believe, a weakness for fibres, and has written extensively on tropical economic products generally. Those who know "Our Friend" at Haarlem, tell you that he is truly a case of "the right man in the right place."

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8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

APRIL, 1913.

More Soya Beans Wanted.

RESTRICTED SUPPLIES AND HIGH PRICES: THE ENGLISH INDUSTRY DECLINING FOR WANT OF RAW MATERIAL.

THOSE of our readers who follow the prices quoted by us, month by month, for coco-nut products, soya beans, &c., will have noticed how high prices for soya beans and soya-bean oil have remained. This lends force to a paragraph that recently appeared in the *Indian Trade Journal* showing that, according to a Liverpool trade circular, Manchurian soya beans during 1912 were used in large quantities by European crushers and extractors, but that, owing to the continued high level of prices, results in many cases were unfavourable compared with former years. The export from Vladivostock from September, 1911, to October, 1912, was only 317,965 tons, practically the same as the season before. The total commercial crop grown is roughly 1,500,000 tons, and it will be seen, therefore, what a large proportion is used in the East itself, owing to the local demand from the Manchurian crushing mills and also from Japan. In 1911, for instance, Vladivostock exported only 317,000 tons. Accepting that the available surplus in 1912 was 320,000 tons, we find that nearly 120,000 tons were contracted for Europe, and 100,000 tons for Japan, which leaves a balance of 100,000 tons. Japan imported in 1911 165,000 tons, and as there was a much bigger demand last year, that island probably took 200,000 tons in 1912. The output of beans could, therefore, well be much larger, as of this total Manchurian output (1,500,000 tons) only one-fifth was exported last year, and if, as some assert, the entire surplus can and may be used up in 1913 in the East, supplies for this side may fall off to such a degree that what has developed into an important British industry will be seriously crippled for want of raw material. This competitive demand, it is

stated, tends to increase, and therefore makes it difficult, especially at the present time, for the European buyers to secure supplies at prices likely to return a profit, now that linseed is so much cheaper. The exports during November and December, 1912, were 64,000 tons, as compared with 96,500 tons in 1911, and unless the Eastern demand grows less pressing it seems that the quantity used in Europe this season will be much less than usual. It is well known that the proportion of casein in these beans is higher than in almost any other article, and the trade has been greatly impressed of late by the number of chemists and scientific researchers who are busily engaged in endeavouring to perfect methods of adapting this product to valuable commercial possibilities, especially in the way of human food, much in the same way as many fats which were once used for soap-making have been developed for human consumption in the form of margarine.

In face of the above report it is a great pity that the cultivation of the beans has not been pushed more strenuously at centres on which this country can depend for her supplies. Take Ceylon, for instance; instead of being told that the cultivation of the soya bean in that island is not making very much headway, although in Java, Burma, Japan, and Manchuria its cultivation is carried on on a very extensive scale, we should like to hear that a steadily increasing area was being planted up.

Some time ago, the *Times of Ceylon* tells us, the Ceylon Agricultural Society ordered some beans from Java for a few members, the beans from that country being found more suitable to Ceylon. The first beans were obtained from the Straits, but these were not a success. The beans used are of two varieties, and what cultivation exists is most successfully being carried out in Jaffna, Kalutara, Puttalam, and even in the Kandy district, and at present the beans are being used as a vegetable and for green manuring.

On the whole, however, its cultivation in this island does not seem to have "caught on." It can be interplanted with coco-nuts, and as it is a nitrogenous plant the larger trees would benefit. We soon hope, therefore, to hear better accounts of the soya-bean plantation industry in Ceylon.

Meanwhile it is well to note that the lack of supplies complained of is causing, according to a most reliable authority (the *Manchester Guardian*), our soya-bean crushing industry, which was started under such favourable conditions some three years ago, to be apparently on the decline already. At first the new oil was sold at considerably less than the price of cotton oil and became a valuable material for soap manufacturers; but in 1911 the imports of beans fell off by about 50 per cent., as compared with those of the previous year, and since then the price has gradually become much dearer relatively. During the scarcity of linseed oil, soya-bean oil was used largely, not only as a substitute for soft-soap making, but even to replace linseed as a painter's oil. At the present time the cost of soya oil is actually greater than that of linseed oil, and all this market for it has, as a result, been lost. The tendency seems to be, the same paper continues, for the trade of crushing soya beans to transfer itself to Germany, but there does not appear to be any good reason why some effort should not be made to recapture it. It is rather curious to see a new trade start into great activity and then dwindle

away in the course of only two years, and it would be interesting to discover the reason for this unusual phenomenon in the annals of commerce.

According to Dornbusch, reports from Manchuria show that expectations even of the present crop of soya beans have not been fully realized. The total outturn will not be larger than 1912; although in a good many districts the crop may be 30 to 40 per cent. larger, there are several places where failures of the crop are now being reported. There are also several factors which are raising the prices, cost of transport, local demand, &c., &c. With such reports to hand we have no doubt that the cultivation of soya beans will receive more attention elsewhere than in the East. The reason for this is not far to seek. We have several German friends who understand Russian, and speak Chinese sufficiently to trade direct with growers, and through such channels the export of the beans to Germany is encouraged. There the factories probably pay lower wages than we do in England, and are also satisfied with less profit. Be this as it may, we would contend that the quickest and surest remedy is for our friends on British territory to plant soya beans extensively (year by year, so long as it pays) either as a main crop or as a catch crop with coco-nuts, &c. Doing so not only yields a profit from the beans, but, being a leguminous plant, the roots give out nitrogen to the soil and benefit other crops; at the same time important industries in the United Kingdom can be assured of supplies and the output of their factories increased.

According to the Progress Report of the Ceylon Board of Agriculture a correspondent, who is recognized as a soya bean expert, writing from London in September last, furnishes the following information: "The present price of soya beans from Vladivostock to England is £9 per ton (2,240 lbs.) c.i.f. The demand is overtaking the supply, and Germany is England's most serious competitor in the North-Manchurian trade. I understand that they are able to utilize nearly all the beans produced in Southern Manchuria for food, crushing purposes, and shipment to China and Japan."

Another London correspondent, writing in October last on the same subject, says: "There is huge demand for soya beans in the United Kingdom and the Continent owing to the fact that the supply is nothing like equal to the demand. Four years ago these beans were sold in the London Market at a spot price of £4 per ton, and to-day their spot price is £9 2s. 6d. per ton, the price having more than doubled itself."

The following summary of the uses of the soya bean and its products is interesting: For dynamite and high explosives, soap, linoleum, India-rubber substitute, margarine, paints and varnishes, in place of linseed oil, various edible foods, toilet powder, salad oil, vegetable cooking oil in place of lard, oil, &c., preserving sardines, lamp oil, lubricating, as food in place of peas, flour for soups, biscuits, brown bread, artificial milk and cheese, substitute for coffee, for sauces; cake for feeding cattle, and for manure.

Inquiries have been received from a local firm dealing in cattle food with a view to employing soya beans in connection with their business which is considerable.*

As to which variety pays best to plant, it will be remembered that Professor Wyndham Dunstan, the Director of the Imperial Institute, has furnished the following report on a sample of soya beans grown at Jaffna from seed imported from Java: "The sample consisted of small black seed mixed with some brown immature seeds and some impurities. Yield of oil 14.5 per cent. Yields of from 13.3 to about 22 per cent. have been recorded for soya beans, the usual amount being about 17 per cent. The oil possessed the characteristics of soya bean oil. The oil was not submitted to chemical examination. The current price of soya beans at Hull is £8 13s. 9d. per ton (August, 1912). The present sample would not realize such a high price, owing to the dark colour of the beans and their small size, the low yield of oil, and the presence of foreign material. It would be advisable to cultivate in Ceylon the more valuable ordinary yellow commercial variety of soya bean in preference to this small-seeded kind. A sample of the yellow variety is forwarded with this report." Good results have, we know, been obtained from the light coloured, almost white variety of beans which are being sent out in considerable quantities from London as seed, after having been hand-picked and graded to ensure an even sample in the crops. Such beans are preferable to the black and darker kinds, which make a dark and therefore less attractive flour or cake, a point that must not be overlooked. These light coloured beans are reported to average 18.9 per cent. of oil. Elsewhere than perhaps in a few very hot damp valleys they have given satisfaction, although other kinds are said not to thrive at the lower elevations. Arrangements, we understand, are being made to introduce the selected beans into Ceylon. It may be remembered that both the red and white Burma beans were reported as being dangerous feeding stuff for cattle on account of the fluctuating amount of prussic acid in them.

Cacao and Coco-nut Butter.

THE following is from the *Journal of Chemical Technology*:—

"Duyek. (*Ann. de Chim. Anal.*, 1912, 17, 11, 405). A summary of experiments on various methods for detecting adulteration in cacao-butter. The official French method demands the determination of (a) the temperature of solution in absolute alcohol; (b) the saponification number; (c) the iodine value; (d) the volatile insoluble acids. The author also determines the acidity of the sample. In German tests the refractometer index, the melting point and Bjorklund's test are also required. Robin detects coco-nut oil (5 per cent.) by finding the solubility in alcohol (55.5°) and comparing the co-efficient obtained with the saponification number. For pure cacao-butter the constant lies between 7° and 8°, but is considerably decreased in presence of very small amounts of coco-nut oil. (*Ann. de Chim. Anal.*, 1906, p. 454; 1907, pp. 14, 40, 87, 181.) Coco-nut fat gives a figure of 15 to 18 (cc. N/10 NaOH for 5 gm.) for volatile insoluble acids, considerably higher than that for cacao-butter, and at the same time raises the saponification number and lowers the refractive index and the iodine figure. Bjorklund's ether solubility test is valuable for the detection of wax, margarine and paraffin, especially when the melting-point also is

* See last paragraph on p. 69 (*Economic Zoology*) comparing soya and cotton cake for cattle feeding.

taken of the fat which is deposited on cooling the solution to 0°. This melting-point should not exceed 30°. The acidity of commercial cacao-butter, when not rancid, is not greater than 0.5 per cent., expressed as oleic acid. Cacao-butter is also adulterated by the addition of fat from the pellicle and other waste parts of the plant. This fat is less aromatic than the true "butter" and rapidly becomes rancid. It is hardly possible to detect this adulterant with certainty."

The Rubber Industry in Queensland.

IN the Annual Report of the Department of Agriculture, Queensland, for the year 1911-12 (just presented to both Houses of Parliament) appears the following on the rubber industry:—

"The demand for this product is so great and the cultivation of it so easy, provided one can afford to wait until the tree is productive, that more interest should have been taken in its cultivation, if only as a substitute, should it be necessary for a farmer to give up the cultivation of the sugar-cane. Though the area under erop is not yet sufficient to arrest the attention of the Government statistician, it is no new thing here, the first plantation having been made by Messrs. Seymour and Allan as far back as 1890 on the banks of the Mourilyan Harbour. Unluckily for them they chose the wrong variety, and their venture was destroyed by a hurricane. In 1898 this department imported plants, and has also received consignments on many occasions since, but no material interest has been taken in it, particularly in its natural country to the north of Mackay, though rubber-growing trees are to be found on the coast from North to South of Queensland. At present it may be estimated that there are about fifty acres under Pará rubber cultivation, but this area, compared with the industry in New Guinea, is but infinitesimal. There, though the opportunities have been but of a much more recent date, the planters have begun to ship to Europe, while Queensland has lagged behind.

"It is now recognized by tropical agriculturists that the soil, climate, and rainfall in North Queensland are all that can be desired for the cultivation of rubber and coco-nuts. This is amply evidenced by the healthy appearance and rapid growth of such rubber trees as are planted at the Kamerunga State Nursery and elsewhere on the northern coast lands."

Homœopathy and Tropical Disease.

IT is difficult for a daily paper to discuss medical subjects. The question of the treatment of malarial fevers, &c., is, however, so urgent for my tropical readers that I am encouraged, says the editor of the *Overseas Mail*, to print the following letter from a correspondent in Mauritius:—

"I myself speak from an experience of over fifty years of homœopathy. Thirty years of my life have been spent in the Tropics, in climates and countries popularly supposed to be deadly to the European. During the whole of this period, though a layman, I have had to be my own doctor (in the absence of any

homœopath), and doctor to my family, all my servants and coolies, and many of my friends.

I have treated innumerable cases of the most severe tropical diseases by homœopathy, including enteric, diphtheria, dysentery, malarial zymotic, and other fevers, and a host of common ailments. With the exception of the first case of cholera I ever treated in India, twenty-eight years ago, I have never lost a single case, if I except two of elderly men in a dying condition abandoned by all medicos, whom I was asked to help as a last resource.

I have no hesitation in saying at once after observation of the old school treatment in full blast all round me during the whole of that time, that one of the most deadly influences to Englishmen in the Tropics is the allopathic treatment and the allopathic drug shop.—*The Times of Ceylon*.

White v. Black Labour.

WE are glad to see that a start has been made to replace black labour by white, thereby allowing the blacks (if they wish, as we hope they will) to go back to the land and help to increase the world's supply of food, instead of, like the whites, loafing round towns and cities, eating the insufficient supplies produced by others.

We say this because the London *Daily News*, in a report on labour in Africa, spoke of the success of employing "poor whites" on the railway.

This arose in the course of a debate in the Union House of Assembly at Cape Town, on Sir Percy Fitzpatrick's motion recommending the appointment of a Commission to consider the question of extending the field of employment for Europeans in the Union, when Mr. Sauer (Minister of Agriculture) gave figures showing that 5,000 poor whites had replaced natives on the railways, and indicated that the experiment had been a success.

Referring back to the remarks in the leading article of our February issue on the possibility of transferring white families to the Tropics to the advantage of themselves and of the Empire at large, it will be remembered that at the time we commented on the shameful exploitation of the labour of children down to 3 years of age in New York, in order that the family might not starve. In a paragraph in the obituary notice of Sir William Arrol, the builder of bridges, the following significant sentence was included: "They were not very prosperous, and at the early age of 9 the future engineer was sent to work as a piecer in a cotton mill. Many a thousand lads have gone under with the long hours and hard work of the cotton mill; Arrol had two years of it, and survived."

The term "many a thousand" appeals to us as being very significant. This is not the first time the cotton *manufacturing* trade has been spoken of in the past as a children's Juggernaut. In the United States we fear the state of affairs is still far from perfect, whatever it may now be on this side, and for this reason, especially now that the supply of raw cotton is short, we feel that children would be far better out in the fields *picking* cotton than locked up in a building *manufacturing* it under conditions which we are told in Sir William Arrol's childhood caused "many a thousand" to go under.

Are Dry-Farming Methods an Advantage in the Tropics?

THE manual on "Dry Farming: a System of Agriculture for Countries under a Low Rainfall,"* published by Dr. John A. Widtsoe, A.M., Ph.D., President of the Agricultural College of Utah, came to hand at much about the same time that we received an issue of the *Times of Ceylon* (February 4th), with two most interesting articles on the possibilities of "Dry Zone Cultivation in Ceylon," the first being the report of a paper read by Dr. H. M. Fernando before the Ceylon Agricultural Society on the subject, and the second a series of paragraphs by the paper itself dealing with various products that might be cultivated by dry-farming methods. Both the book and these articles should be carefully studied by all those owning or interested in lands in tropical centres, as by their doing so many areas at present neglected and further deteriorating would, we believe, not only be made revenue yielders, but would also tend to become more fertile. "Nearly

six-tenths of the earth's land surface," Dr. Widtsoe tells us, "receive an annual rainfall of less than 20 in., and can be reclaimed for agricultural purposes only by irrigation and dry farming. A perfected world-system of irrigation will convert about one-tenth of this vast area into an incomparably fruitful garden, leaving about one-half of the earth's land surface to be reclaimed, if at all, by the methods of dry farming." Unfortunately we have

no room to properly review the book, but a glance at the index is bound to send the most indifferent cultivator, if he is in any wise worthy of the name, foraging through the book to see what it has to say. Take the question of root systems, to which Chapter VI is devoted, here we find discussed such matters as functions, kinds, extent, and also depth of root penetration. The present status of dry farming is described in Chapter XVIII throughout the United States, and then in Mexico, Brazil, Australia, Africa, and the East. So much for places; now for products; and the *Times of Ceylon* again. This paper tells us that "The growing demand for land for the cultivation of the more important commercial products and the opening, in recent years, of extensive plantations has resulted in a very large area of what is con-

sidered suitable land being absorbed; the possibility of cultivation in the dry zone (*i.e.*, of Ceylon) has therefore been attracting attention for some time; this being so, the point to be considered is what products can be profitably cultivated in this arid zone." The following crops are discussed and recommended: Ceará rubber, tobacco, cassava, chillies, ground-nuts, as well as the raising of stock and the fodder to feed them. Dr. Fernando's paper also discusses the same ideas. From all we can learn from these and other reports† on the utilization of tropical areas with a low rainfall, we feel certain that a far larger number of land-owners should make careful studies of the advantages offered by the modern system of dry farming.

Dr. Widtsoe's remarks on pp. 92, 93 are worth noting by those who believe, as we do, in breaking up the top soil between cacao, rubber, and other trees in the Tropics, to conserve the moisture during times of drought, by breaking the capillary attraction that draws the subsoil water to the surface when it evaporates and is lost, but fear to do so, lest by damaging the surface

roots they do more harm than good. "A great deal," he tells us, "has been said and written about the danger of deep cultivation, because it tends to injure the roots that feed near the surface. True, deep cultivation, especially when performed near the plant or tree, destroys the surface-feeding roots, but this only tends to compel the deeper lying roots to make better use of the subsoil. When the subsoil is fertile, and furnishes a sufficient



Illustration showing the "Marshall" Oil Tractor with a Cultivator attached, at work between young rubber trees on an estate in the East.

amount of water, destroying the surface roots is no handicap whatever. On the contrary, in times of drought, the deep-lying roots feed and drink at their leisure, far from the hot sun or withering winds, and the plants survive and arrive at rich maturity, while the plants with shallow roots wither and die, or are so seriously injured as to produce an inferior crop . . . (for reasons stated); an excess of moisture in the upper soil when the young plants are rooting is really an injury to them." There are those who claim that no one can plough between cacao and rubber trees, but we know that they can and do cultivate if they are wise, and as a proof that what we say is correct, at any rate as regards rubber estates, we have borrowed a photograph from Messrs. Marshall, Sons & Co., Ltd., of Gainsborough (Eng.) showing their Oil Tractor at work between the young trees on an Eastern rubber estate.

* The Macmillan Company, New York, U.S.A., and Toronto, Canada; also of Macmillan and Company, Ltd., of Melbourne, Calcutta, Bombay, and London (St. Martin's Street, W.C.); our readers in all parts of the world, therefore, can secure copies, or we will send one to any reader of *TROPICAL LIFE*, for 7s. 6d. post free. The book carries 443 pages, including 111 illustrations, and concludes with an excellent list of books dealing with dry farming.

† G. S. Henderson, N.D.A., N.D.D., Deputy-Director of Agriculture, Sind, India, contributed a well-written and freely illustrated article on "Dry Farming" to the *Agricultural Journal* of the Pusa Institute, for January, 1913.

The block included here shows that the Tractor and Cultivator can easily pass up and down between the trees, and by doing so the fertility and yielding-power of the soil is greatly increased.

Those who have stood in cacao and other estates in the full Tropics, where damp and heat are rampant, if they are not prejudiced against inter-crop cultivation, must realize as they notice the damp, dark, often sourish soil, the moss growing over it and up the trunks, lichens and epiphytes also, what an advantage it would be to break up this top spit and let out, in this case, excess moisture, and allow air to get down below. This is in the wet or damper seasons. In the dry seasons, and those of prolonged drought, as Trinidad and the West Indies have been suffering from, this broken surface would turn into a dust mulch, and the roots driven downwards in consequence of your having persistently ruptured the surface weeders, would surely, as Dr. Widtsoe says in speaking of arid lands, find that coolness, air, and moisture below that they cannot obtain nearer the surface, and which, on uncultivated areas, they would never have access to.

Indian Wheat and Irrigation.

PUMPING and irrigation engineers should study the 1911-12 report of Mr. Howard, M.A., Economic Botanist to the Government of India, as it shows what can be done to crops, wheat particularly, thanks to scientifically organized schemes of irrigation.

As most of the wheat exported from India is grown under irrigation, the *Indian Trade Journal* reports, it was important to ascertain by actual trials whether high grain quality and high yield could also be obtained under canal irrigation. In this portion of the investigations the active co-operation of Mr. H. Martin Leake (Economic Botanist to the Government of the United Provinces) was secured, and extended trials of the Pusa wheats have been carried out during the past three years at Cawnpore. The results obtained were, says Mr. Howard, most satisfactory. In the first place, it was found that yields over 2,200 lbs. per acre, and in one case as high as 2,500 lbs., could be obtained with one watering, that is, with one-third the water usually employed by the cultivators in the neighbourhood. In the second place, the appearance and milling and baking qualities of the wheats were at least equal to those grown at Pusa under *barani* conditions. This was the verdict of Mr. Humphries (a past president of the Incorporated Society of British and Irish Millers) who, in 1911, tested the same kinds grown at Cawnpore under canal irrigation and at Pusa as a dry crop. During the last *rabi* season, one of the Pusa wheats was grown at Cawnpore without any irrigation water at all and a yield of 1,650 lbs. to the acre was obtained.

MESSRS. TREWHELLA BROS., makers of the well-known lever jacks and stump grubbers, inform us that the name of their company has been changed to Trewhella Bros., Pty., Ltd., and the directors will be glad if their customers and correspondents will make a note of same. Their addresses remain unaltered, viz.: 6, Alma Street, Soho; Smethwick, Birmingham; and Trentham, Victoria, Australia.

Route for Another Panama Canal.

SPEAKING after a dinner held by the London Chamber of Commerce at the Trocadero, Senor Perez Triana, Chargé d'Affaires for the Republic of Salvador, told those present that "since the days of Columbus there had been numerous projects for building a canal, but there was one route in existence of which one heard nothing—it was there for the day when the requirements of trade and commerce would be so large that two canals would be needed. The route he referred to was the Atrato River, which flowed into the Gulf of Uruga, quite close to the Isthmus of Panama. It was a perfectly navigable river, and its upper reaches were comparatively near to the Pacific littoral. The site had been studied by a well-known engineer, who had stated that this route would be considerably cheaper than the Panama Canal. Humanity would so progress, both materially and morally, that the day would come when both canals would be free and open to the whole world.'

Manuring Notes.

THE liberal outlay on manuring and cultivation seems now to be bearing fruit, says the Report of the Tonacombe Estate, Ceylon. In moving the adoption of the report the Chairman stated that they had to announce that they had a record crop. For several years past, in spite of liberal but not excessive cultivation, they had always had to come to the shareholders and acknowledge that they were a little short of their estimate. Last year they were considerably short. They could congratulate themselves now that both manure and cultivation were at last taking effect; and not only had they got their estimate and a record crop, but their visiting agent and superintendent had authorized them to put up their estimate another £5,000 this year, and at the rate the crop was coming in there seemed every possibility that they would get it. Rubber also showed a prospect of a considerable increase.

The Report of the Aranayahe Rubber Estate supports the experience of Tonacombe as to the advantages of manuring.

The growth of the rubber trees during the past year has been excellent, they tell us, particularly so in the fields that have been manured. The growth of the rubber trees in the tea field was being retarded by the tea, and it was decided to cut out the latter, and this work is now nearing completion.

In regard to manuring coco-nuts, the Hon. E. Rosling, Chairman of the North-Western Rubber Co., told his shareholders their policy was to manure half the trees every year. All the trees had been manured once, and half twice in the last three years, and in the visiting agent's last report, dated December 20th, he refers to this product as follows: "I have never seen the trees look better or carrying more nuts at this season of the year, and everything points to an increased yield next year."

A new feature in irrigation as regards Ceylon has been the provision for the extension of irrigation (which hitherto has been almost entirely confined to rice growing) to plantation products, such as coco-nuts and rubber. A considerable area has been reserved for this purpose under the Nachchaduwa scheme in the North-Central Province, and a new work, the Tabbowa scheme, near Puttalam, has been commenced recently with a view to opening up and irrigating land for coco-nut growing.

Cotton.

THE following were the prices for Cotton in London on April 4th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.	Fine.	Superfine.	Good, 1912.		Compare Good, 1911.		per lb.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	
Surat kinds*	5 $\frac{7}{8}$	to 6 $\frac{1}{2}$	6 $\frac{1}{8}$	to 6 $\frac{5}{8}$	6 $\frac{3}{8}$	to 5 $\frac{7}{8}$	6 $\frac{1}{8}$	to 7 $\frac{1}{8}$	—	
Madras	6 $\frac{1}{4}$	to 6 $\frac{3}{8}$	5 $\frac{3}{4}$	to 6 $\frac{5}{8}$	—	4 $\frac{7}{8}$	to 5 $\frac{1}{2}$	6 $\frac{1}{8}$	to 7 $\frac{5}{8}$	—
Bengal	—	—	5 $\frac{5}{8}$	to 5 $\frac{7}{8}$	6	4 $\frac{7}{8}$	—	6 $\frac{1}{4}$	—	—
Assam	—	—	5 $\frac{3}{4}$	to 6 $\frac{1}{8}$	6 $\frac{3}{8}$	5 $\frac{3}{8}$	—	6 $\frac{1}{2}$	—	—
China	—	—	5 $\frac{7}{8}$	to 6 $\frac{1}{8}$	6 $\frac{3}{8}$	5 $\frac{3}{4}$	—	6 $\frac{1}{2}$	—	—
West Indian	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	to 8 $\frac{1}{4}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	—	8 $\frac{3}{4}$	—	—
Sea Island	12 $\frac{1}{2}$	—	15	to 18 $\frac{1}{2}$	22	13 $\frac{1}{2}$	—	14 $\frac{1}{2}$	—	—
West African	6	—	6 $\frac{5}{8}$	to 6 $\frac{3}{4}$	—	6 $\frac{1}{8}$	—	7 $\frac{5}{8}$	—	—
East	6 $\frac{1}{16}$	—	7 $\frac{1}{16}$	to 9 $\frac{7}{16}$	—	7 $\frac{1}{16}$	—	8 $\frac{5}{8}$	—	—

* Liverpool quotations.

The continuation of war in the Near East on the one hand, with reports of actual and anticipated floods in parts of the Cotton Belt on the other, combine to keep the trade in an unsettled state, but there has been a slight tendency to harden, and prices close 7 to 6 dearer for old, and 5 to 3 for new crop deliveries. East Indian has been in better demand, but prices asked check business.

The import into Liverpool this week amounts to 52,936 bales, since September 1st 3,778,011; same week last year 166,790, last year's total 3,982,173 bales. The estimated Sales amount to 41,000 bales, including "called." Middling American is quoted at 6.99d. per lb., last year 6.17d., 1911, 7.66d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.
Brought into sight	12,318,000	14,185,000	10,868,000
Exports from United States since September 1st—			
To Great Britain	3,029,000	3,678,000	3,051,000
To Continent, &c.	3,782,000	4,835,000	3,433,000
Total crop	—	16,138,000	12,120,000

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	April 6th.	Same time 1912.	Same time 1911.
April	6.73	5.94	7.43
April—May	6.72	5.93	7.43
May—June	6.72	5.93	7.43

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

THE market was fully supplied during the first week in April, and with a better demand prevailing prices generally showed an advance. About 4,000 bags of East India were sold, values at the close being 1s. to 2s. dearer; some choice Mysore met with competition from the Home trade, and realized extreme rates. Costa Rica was in good request, and nearly 10,000 bags were disposed of at an advance of fully 1s. per cwt. Other Central American kinds were also very steady to dearer, and Unwashed Dumont Santos partly sold at firmer prices. "Futures" have fluctuated slightly, and the closing price of September Santos is 4 $\frac{1}{2}$ d. lower for the week. We quote :—

	To-day	March 27th, 1913
London	Santos, Sept. del. 53s. 7 $\frac{1}{2}$ d.	54s. 0d.
New York	No. 7 Rio 12.04 cents	12.23 cents
Hamburg	Santos 60 $\frac{1}{2}$ pf.	61 pf.
Havre	Santos 74 $\frac{1}{2}$ francs	75 $\frac{1}{2}$ francs

The receipts at Rio and Santos from July 1st, 1912, to April 2nd, 1913, were 10,451,000 bags, against 11,281,000 bags, and 9,861,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India.—Mysore, 70s. to 76s. 6d. for smalls, 73s. to 84s. for low middling to fine middling, 76s. to

90s. 6d. for low middling to fine bold, and a parcel of choice Home Trade quality at 89s. 6d. to 91s. for second size and 103s. 6d. to 106s. for bold.

Coorg.—70s. 6d. for smalls, 74s. to 76s. for second size, 77s. to 79s. for bold.

Naidoobatum.—75s. to 79s. for second size, 76s. 6d. to 85s. 6d. for bold.

Wynaad.—77s. for second size, 82s. for bold.

Sumatra.—At 78s. for Liberian.

Costa Rica.—At 71s. to 76s. 6d. for smalls, 69s. to 75s. for ordinary to fine fine ordinary, 75s. 6d. to 85s. 6d. for low middling to good middling, 76s. 6d. to 91s. 6d. for low middling to fine bold.

Guatemala.—At 69s. 6d. for smalls, 68s. 6d. to 75s. for ordinary to good middling, 74s. 6d. to 81s. 6d. for bold, 98s. for Maragogipe.

Nicaragua.—At 78s. to 83s. for good middling, 94s. 6d. to 96s. 6d. for fine bold.

Vera Paz.—At 66s. 6d. to 77s. 6d. for ordinary to middling, 80s. to 98s. 6d. for middling to fine bold. 105s. 6d. for Maragogipe.

Mexican.—At 72s. to 74s. for smalls, 73s. 6d. to 76s. 6d. for middling to good middling, 76s. 6d. to 79s. 6d. for bold.

Venezuela.—At 74s. 6d. for bold greyish.

Colombian, &c.—At 65s. to 72s. 6d. for common to fine fine ordinary, 73s. 6d. to 78s. for bold.

Dumont Santos.—Unwashed at 61s. for smalls, 66s. for medium, 66s. 9d. to 68s. 6d. for bold.

Sugar.

THERE was more activity in the market at the beginning of April, wrote Mr. C. Czarnikow, and notwithstanding a further fractional decline in New York (from 3.48 cents to 3.45 cents), and the sale of two Cuban steamers to Greenock at about 10s. 6d. c.i.f., we had a temporary improvement from 9s. 11½d. to 10s. 1¼d. (closing at 9s. 11½d.) in May beet, partly based on demand for Refined. Some consumers suddenly discovered that there was a deficiency in Russia of 900,000 tons, and argued that if this had occurred in Cuba there would be a rise not of farthings, but of shillings, to which statement we cordially subscribe. But the 900,000 tons shortage in Russia, which was known and discounted since November, means maximum 250,000 tons for the world, and if these had been in the market we might have prices nearer 9s. than 10s. On the other hand, a shortage in Cuba as above would really mean 900,000 tons to be bought in the world's market, and if America had wanted to buy these here we doubt whether the rise would have stopped at 15s. But as America does not want them, we have to continue haggling about farthings, probably until the sowings are finished, and till next crop fixes the prices for the old.

In Russia prices of export certificates have risen, which shows less desire to hold old sugars over into next crop at full prices. Holders will probably wait till after the start of the coming crop before getting close to export values. Each producer holds a strictly limited quantity of home allotments, entitling him to deliver to the home trade. The exporting fabricant sells his home allotment to another producer who has more sugar than he wants, and who would like to deliver more than his quota at home, instead of exporting. He usually cannot buy these additional allotments easily, unless he pays the difference between export and home values. Instead of lowering the syndicated home prices, the makers raise the allowance to exporters, viz., the price of export certificates. When stocks in Russia are low certificates are cheap, as nobody wants to pay dear for increasing his home deliveries. When United Kingdom values are cheap, and Russia has a good crop, then export certificates are dear, but United Kingdom is not the only factor, Turkey, Persia, &c., play their own part as well.

The Cuban receipts show that there remain 1,010,000 tons against 897,000 tons to produce during April-October in order to reach 2¼ million tons. This and more should be easily possible with the larger yield and milling power if the rainy season does not set in too early. More sugar is being stored at the factories than last year, when prices were high and kept on declining, so that sugars were hurried forward, whilst this year the producers had an inducement to hold sugars back. There are 173 factories at work against 172 last year.

The American market has been quiet, and 96 per cent. Centrifugals have relapsed to 3.45 and 3.48 cents for Porto Ricos and Cubas=9s. 9d. c.i.f. New York, or 10s. 4½d. c.i.f. United Kingdom basis 96 per cent.

In the United Kingdom business in Cane Sugar has again been upon a small scale, except that a few cargoes of Cuban Centrifugals have been sold to this side at 10s. 10½d. floating, landing, United Kingdom,

basis 96 per cent. polarization. Grocery Crystallized at auction sold in moderate quantities at steady to rather easier rates. Low brown descriptions are offered a little more freely.

From Cane-producing countries there are no further news to hand.

Sales include British West India, Crystallized Demerara, low grey and yellow, 15s. 6d. duty paid; good yellow, 17s. 3d.; fine ditto, 18s.; Syrups, good brown, 11s. 6d. to 12s.; low yellow to low middling ditto, 12s. 6d. to 12s. 9d. Crystallized Jamaica, good middling yellow, 17s. 3d.; good yellow, 17s. 6d. to 17s. 9d. Crystallized St. Lucia, middling greyish, 16s.

At auction, of 2,010 bags yellow Crystallized Mauritius offered, 1,200 sold at 18s. duty paid; 200 tons brown Syrups, April-May shipment, sold at 8s. 7½d. ex-ship London, and 193 pockets Guatemala Syrups sold, low middling grey realized 11s. 6d.; good grey, 13s. 9d.

In Liverpool, 4,000 bags of Peruvian Syrups sold at 9s. 10½d. to 9s. 6¾d. quay telquel; 1,900 blocks Chancaca at 8s. 7d. quay telquel. About 300 bags grainy Mexican realized 12s. 6d. quay.

Coco-nut Products, &c.

COCO-NUT oil, reported Messrs. Mordaunt Bros., on March 29th, is difficult to get in any position, and now commands quite extravagant figures, say Cochin 45s. to 45s. 3d., and Ceylon 42s. and 42s. 6d. c.i.f. terms. Prices, however, had advanced a further 15s. to 30s. ton by April 5th, but such a price was checking the demand. Ceylon had advanced to 43s. 6d. to 44s. 9d., but Cochin stood at 43s. 6d., and Pressed Oil from 40s. to 40s. 6d. to 41s. to 41s. 6d. f.o.b. Palm kernel oil had also shared in the rise, being about 30s. dearer, standing 40s. 9d. to 42s. 6d. April 12th found prices no higher for coco-nut oil, but the article was unusually scarce, and commanded very full prices. Cochin was quoted 46s., and Ceylon 43s. 9d. to 44s. per cwt. c.i.f. terms. Pressed oil had, however, advanced to 41s. to 42s. 6d. f.o.b. Palm kernel oil is selling easily at 41s. to 42s. 6d. f.o.b. Hamburg; meanwhile prices on April 12th ran as follows:—

<i>Palm oil (Liverpool):</i>		1913	1912	1911
Per cwt.				
Lagos ...	... 31s. 6d. to 31s. 9d.	28s.	30s.	
Benin ...	... 29s. to 29s. 3d.	27s. to 27s. 3d.	29s. 6d.	
Congo ...	... 26s. to 26s. 6d.	25s. 6d.	25s.	
Bleached ...	... 33s. 3d. to 34s.	31s. to 31s. 6d.	33s.	
Clarified ..	... 29s. to 30s.	28s. to 28s. 6d.	29s.	
<i>Palm kernel oil...</i>	<i>42s. 6d. to 42s. 9d.</i>	<i>35s. 9d. to 36s.</i>	<i>33s. to 33s. 6d.</i>	
<i>Coco-nut oil:</i>				
Cochin ...	... 50s. 6d.	43s.	45s. to 47s.	
Ceylon ...	... 45s.	41s. 6d.	38s. 6d. to 39s. 6d.	
English pressed	42s.	35s. 6d. to 36s. 6d.	35s.	
<i>Copra oil:</i>				
Ceylon ...	... None	38s. to 39s.	38s.	
Cochin ...	... None	42s. 6d.	42s.	

According to the *Public Ledger* of April 12th, prices ruled as under (per ton):—

Soya Oil Beans steady. Parcels, Harbin spot, £8 5s. Hull, afloat, £8 5s.; February-March, £8 5s.; March-April, £8 5s.

Linseed Cakes.—London-made, £7 12s. 6d. to £7 15s.

Cotton Cakes.—London-made, £5 16s. 3d. to £5 17s. 6d.

Copra quiet. Manila, January-March, £30 7s. 6d. sellers; February-April, £29 7s. 6d. sellers; March-May, £28 17s. 6d.; and April-June, £28 6s. 3d. sellers, Cebu, March-April, £30 sellers. Java, January-March, £30 7s. 6d. sellers; February-April, £29 17s. 6d. sellers Northern Ports nett. South Sea Islands, March-April, £29 sellers Continent; March-April, £29 sellers London. Malabar, March-April, £31 7s. 6d. sellers, and April-May, £31 2s. 6d. Ceylon, March-April, £30 12s. 6d. sellers Northern Ports. F.M.S. Straits, April-May, £29 12s. 6d. sellers Northern Ports. F.M., April-May, £29 5s. sellers. Mixed no Padang, April-May, £28 12s. 6d. sellers. Macassar, March-April, £29 10s. sellers c.f. and i. delivered weight.

Soya Oil.—London: Barrels spot London-make, £26. Hull: Naked crushed spot, £24 10s.; extracted spot, £23 12s. 6d. Oriental firmer (in cases), February-March, sold at £24 2s. 6d. c.i.f. Antwerp; March-April, £23 2s. 6d. c.i.f. (a fair quantity sold at £23 15s. c.i.f. London); April-May, £23 2s. 6d. c.i.f. Antwerp (£23 10s. paid c.i.f. London).

Coco-nut Oil firm. Ceylon spot, £45; March-April, £44; April-May, £43 15s. c.i.f. Cochin spot, £50 10s.; April, £46 5s.; April-May, £45 10s. c.i.f.

Palm Oil.—Lagos on spot, £35.

Palm Kernel Oil.—April, £43; May-June, £42 10s. f.o.b. Hamburg.

Messrs. Goodlake and Nutter report that the market keeps very firm, especially for Ceylon near positions, principally brought about by the demand from America. We quote for near arrival £45 5s.; March-April, £45; and April-May, £44 12s. 6d., with buyers at £44 7s. 6d. c.i.f. New York. There has been a fair amount of business done for the United Kingdom, both for near and forward positions, and we quote February-March, £44 10s.; March-April, £44; April-May, £43 15s. c.i.f. London. Cochin: There has been a little inquiry, both for this and White, but the prices now ruling have rather stopped business. We quote £46 10s. for March-April; £46 5s. April-May. Palm Kernel Oil: In sympathy with kernels, which are somewhat flat, this has declined, and whereas the early part of last week April was quoted £43, and May-June, £42 15s., yesterday business was done at £42 12s. 6d. for the former, and we quote the latter £42 5s.; July-December, £40 15s. f.o.b. Hamburg. Pressed Oil: There has been a very big demand, and there is practically nothing to be had for near positions. We quote £42 for April; £41 15s. May; £41 10s. June f.a.s. London in Ceylon casks. Spot prices: Cochin, £47 10s. to £50 10s.; Ceylon, £44 10s. to £47 10s.

The India-rubber Market.

By Messrs. SAMUEL FIGGIS and SON.

APRIL opened with a flat market, with sales of near and distant at lower prices. Prices at the auctions were forced down by small speculators; the weakness in Brazil, coupled with ample receipts, and the high rate of money, all helped. America also continued to be a bad market.

With Fine Hard Pará down to 3s. 5d., and First Latex Crêpe forward at 3s. 4½d., the 885 tons Eastern Plantation kinds offered at the sales on April 1st to

3rd were mostly sold, first at fairly steady, but then at declining prices towards the close, showing a total fall since last sales of 4d. to 6d. per lb.; Smoked Sheet and dark common Crêpes selling very badly. Since then a further increased depression has prevailed, and prices steadily declined, Hard Fine closing on April 12th at 3s. 4¼d. value on the spot, against 3s. 5¾d. a week ago. At these rates a fair business has been done; April-May and May-June deliveries at 3s. 5¾d. to 3s. 4½d. and value; June-July at 3s. 5¾d. to 3s. 5d. and sellers; and July-August down to 3s. 5d. and value. Soft Fine continues nominal, closing 3s. 4¼d. value.

Negroheads neglected and lower. Manaoas Scrappy closes 2s. 3½d. value. Cametas nominal at 1s. 11½d. to 2s., and Islands 1s. 10½d. to 1s. 11d.

Bolivian.—Value of fine 3s. 4¼d.

Peruvian.—Fine value 3s. 3¾d.

Caucho Ball lower, with business down to 2s. 5d. for April-May and May-June delivery, closing 2s. 4½d. value.

Mollendo.—Fine quoted 3s. 2¾d. nominal.

Plantation has also steadily declined and on April 12th prices closed 2d. lower. Business has been of fair extent in First Latex Crêpe from 3s. 5½d. down to 3s. 3½d. for spot and April-June delivery; July-September, 3s. 5½d. to 3s. 3½d. and value; and July-December down to 3s. 3¾d. and sellers; and October-December at 3s. 3½d. Smoked Sheet (ribbed) also easier, but sales have been restricted, most positions closing at 3s. 4d. value.

At the opening of the auctions on April 14th to 16th the demand was dragging, and in the absence of support from America and in sympathy with private business done, prices showed a drop on the average of last sale of 4d. to 6d. Subsequently, with an improved demand, prices sharply recovered, especially on the second and third days, when pale Crêpe and Sheets advanced 4d. per lb. and brown and dark Crêpe about 6d. Towards the close, however, the market became easier and prices shed about 1½d. of the improvement.

Malay and Straits: Smoked Sheet, fair to fine, sold at 3s. 0¼d. to 3s. 5¼d., and partly smoked damp and mouldy at 2s. 10½d. to 3s. 4d. Unsmoked, fair to fine, at 2s. 11½d. to 3s. 4d.; damp part mouldy and stuck, at 2s. 10¾d. to 3s. 3¾d. Block, fine pale Lanadron, 3s. 5¾d. to 3s. 6¼d. Crêpe, fair to fine pale and palish part thick gristly, at 3s. 1d. to 3s. 5½d.

Ceylon: Smoked Sheet, fair to good, at 3s. 1¼d. to 3s. 4¾d. Unsmoked Sheet and biscuits, fair to good, at 3s. 0¼d. to 3s. 5d., with very fine white, at 3s. 8¾d. Crêpe, dullish to fine thick gristly, at 3s. 1d. to 3s. 5¼d., with one lot at 3s. 6d., dullish to fine pale and palish, at 3s. 1d. to 3s. 5d.

Outside the auctions Hard Fine Pará fell to 3s. 3d. for near positions, and to 3s. 3½d. for forward. Subsequently a reaction set in, and prices recovered about 2d. per lb., but this improvement has since been barely maintained, although the market closes with a steadier tone and about ½d. better than the closing prices of a week ago.

Up at Liverpool the Pará market during the week has been weak and depressed. The sales totalled 145 tons, including Bolivian fine spot 3s. 5½d.; hard fine, April-May, 3s. 5¾d. to 3s. 5d.; May-June, 3s. 6d. to

3s. 5d.; June-July, 3s. 6d. to 3s. 6½d. to 3s. 5¼d.; and July-August, 3s. 6¼d. to 3s. 6d.; soft fine spot, 3s. 6d.; soft entrefine, 3s. 3d.; scrappy, 2s. 6½d. to 2s. 5d.; Caucho ball, April-May, 2s. 6d.; May-June, 2s. 5½d.; June-July, 2s. 5¼d.; and July-August, 2s. 6d. per lb. Medium Brazilian grades are still rather lifeless. The African market has been dull, and the sales reported amount to 50 tons, including Gold and/or Ivory Coast selected lump 1s. 7d. to 1s. 6½d.; Accra and Niger paste, 11d.; large Lahou cakes, 2s. 3½d.; brown Niger niggers, 1s. 0½d.; and Niger gutta, 9d. per lb.

Pará rubber statistics for the month of March (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará ...	2,900	1,360	= 4,260	agst 4,400	3,530	5,210
Shipments to Europe	2,000	1,190	= 3,190	„ 2,210	2,470	3,400

Crop statistics, June 30th, 1912, to March 31st, 1913 (nine months):—

	Pará.	Caucho.	1912-13.	1911-12.	1910-11.	1909-10.	1903-9.
Pará { 1912-13	27,100	6,330	33,430	30,110	29,230	32,180	30,420
Receipts { 1911-12	25,670	4,440					
„ Shipts. Europe	14,010	4,610	18,620	15,530	15,150	15,590	14,360
„ „ America	13,880	2,110	15,990	16,150	10,530	15,300	15,060

The London Cocoa Market.

By THE EDITOR.

THE market remains quiet but steady; speculators insist that prices must come tumbling down, and point to the increase of 42,000 bags in the Havre stock, and that London also on April 12th had 91,000 bags against 75,002 bags on March 8th. On the other hand, although selling, or at least offering Trinidads “forward,” at continuously lower prices, they are anxious to ascertain what supplies can be relied upon from that centre to make up the serious deficiency her exports showed from October to March, *viz.*: 92,420 bags against 137,915 bags last year, and 120,840 bags the crop before. Although the Gold Coast exported 17,658,000 lb. in January against 14,683,000 lb. (not 46,061,993 lb. as one report gave) in January last year, I noticed that only 5,421 bags were landed at Havre last month, against 16,500 in February, and 24,700 in January; Liverpool, on the other hand, had a heavy month, 87,605 bags being landed, and 53,413 bags delivered, of which 44,447 went for export. If the Havre stock increased 42,000 bags last month, that for Lisbon decreased to double that amount; the figures according to Messrs. Martin, Weinstein being as follows:—

	Bags.
Lisbon stock on February 28th ...	98,109
Landed in March ...	22,121
Total ...	120,230
Less delivered in March ..	62,630
Leaves stock at Lisbon on March 31st, 1913 ...	57,600
Against „ „ „ „ 1912 ...	142,445
Decrease ..	84,845

Guayaquils are perhaps typical of the, at present, somewhat enigmatical state of the market; there is nothing doing apparently in them except indirect business, particulars of which are not reported, certainly no anxiety to buy, and yet the January-March receipts were only 85,500 qtls. against 258,000 last year, and 140,800 qtls. in 1911. In spite of this,

under 250 bags were sold during a fortnight, at prices quoted later on.

The Bahia output also deserves noting, for although her exports keep fairly large, they are considerably in excess of the receipts from up-country, so that the reserve stocks must have been drawn upon, the same as that at Lisbon. According to Messrs. Wilson, Smithett and Co., the Bahia movements run as under:—

Bahia	1913. Bags.	1912. Bags.	1911. Bags.	1910. Bags.
Receipts—Jan.-March ...	75,880	91,605	119,945	95,744
Exports „ „ ...	99,528	120,679	95,629	75,507

Coming now to consumption, our Board of Trade figures for March show a small increase (188 tons) in deliveries for home consumption, 2,503 tons being delivered against 2,315 tons last year; the three months' figures being:—

Raw Cocoa only—	Landed.	Del'd H.C.	Exported.	Stock (March 31st)
Jan.-Mar. 1911—	12,197	5,367	1,537	15,065 tons
„ „ 1912—	13,200	6,628	1,482	14,618 „
„ „ 1913—	12,809	7,481	2,101	12,608 „
Decr.	391	Incr. 853	Incr. 619	Decr. 2,010 „

Of foreign manufactured 2,928 tons were landed in the three months, against 2,666 last year, and 2,865 delivered for home consumption against 2,726 tons in 1912.

Stocks at London and Havre compare as under:—

London Stock, April 12th—	1913. Bags.	1912. Bags.
Trinidads ...	5,486	7,268
Grenadas ...	10,536	15,990
Other W.I. ...	2,964	7,854
British Africa ...	8,801	13,155
Portuguese Africa ...	7,349	5,489
German Africa ...	7,006	5,780
Ceylon and Java ...	23,730	17,649
Guayaquil ...	15,389	42,340
Brazil and Bahia ...	1,371	3,111
Other Foreign ...	8,386	7,522
Totals ...	91,018	126,158

Havre Stock, March 31st—	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
Pará ...	13,306	84 to 90	9,830	75 to 77
Bahia ...	16,286	86 „ 92	16,103	65 „ 69
Venezuela ...	20,248	87 „ 200	45,488	71 „ 200
Trinidad ...	18,029	86 „ 92	34,796	70 „ 73
Grenada and other W.I. ...	3,849	78 „ 90	6,171	63 „ 69
San Thomé ...	10,738	88 „ 90	9,021	66 „ 68
San Domingo ...	8,209	74 „ 78	7,681	59 „ 65
Haiti ...	8,145	71 „ 82	9,993	53 „ 63
Accra ...	58,679	77 „ 81	65,336	61 „ 63
Guayaquil ...	22,274	92 „ 98	11,979	66 „ 72
Others ...	9,071	—	6,288	—
Totals ...	188,884 bags		222,686 bags	

Previous to the public auctions on April 8th, a well-deserved tribute was paid to the memory of the late Mr. Melville Woodhouse, senior partner of the well-known firm of Messrs. C. M. and C. Woodhouse, who passed away somewhat suddenly on the previous day. A great favourite with all ranks he came into contact with, the genial presence of “Mr. Melville” has been already sadly missed down “the Lane,” all noticing with regret the gap caused by his absence from amongst the seniors of the produce brokers.

Before coming to the matter of prices the following extract from a letter of a Jamaica reader of TROPICAL

LIFE is worthy of note, especially as the writer is one of the most respected and experienced owners in that island:—

“On November 16th we had the event of the year. You may judge of the severity and extent of the rainfall (to say nothing of the wind), that my only highway for moving out produce, was re-opened for the first vehicle on January 22nd, more than two months after the floods. Think of 17 in. of rain in twenty-four hours. I fear that my cacao crop for 1913 will be a very small one. Phenomenally heavy rains after a prolonged drought are not promising indications. The uprooting of large numbers of heavy immortelle trees also helped to put things back. In this respect my opinions about shade trees over cacao have been undergoing a change during the past few years.”

As regards sales, including the auctions on April 15th, these work out as under:—

Trinidad.—Very small sales reported. Fine marks at the end of March realized 77s. and 78s., but are now spoken off at least 1s. lower. Mid red are valued at 71s. to 72s., good mid red 73s. to 75s. At the producing centre prices on March 29th were quoted at a parity of 64s. 6d. to 66s., against 70s. to 72s. on March 17th; 76s. to 79s. on March 3rd (due to pressure to cover for February shipments), and 69s. 6d. to 73s. in the middle of February, all c. and f. Havre.

Grenadas sold well on April 8th and 15th, when nearly 5,000 bags were offered, but practically all sold. Fine marks at 67s. to 68s.; common unfermented to fair fermented 63s. to 66s.

Dominicas.—Last month the best marks sold up to 67s., and ordinary unfermented down to 62s.; but on April 15th fine and very fine realized up to 68s. 6d. at these sales, ordinary again realized 62s., and good reddish 64s. to 65s.

St. Lucia.—Fine marks sold up to 69s., and then at 67s. 6d. and 68s.; fair to good reddish 64s. to 66s.; commoner 62s.

Jamaica.—70s. was bid and refused for Ceylon cure, 66s. to 67s. was paid for good red; and ordinary unfermented realized 61s.

Costa Rica showed a rise in values at the opening sales of April, when good red sold at 66s. 6d. and fair 62s., against 61s. 6d. and 64s. 6d. for a little time before.

Java.—Good medium 76s.

Puerto Cabello.—Good clayed sold at 100s. to 110s.

Samana.—Fair reddish sold at 60s.

West African.—In London good fermented sold at 64s. Up at Liverpool sales include 1,650 bags at 58s. 6d. to 62s., and 1,800 bags at 55s. to 61s.; their market is quiet but steady.

Guayaquil.—The very small sales reported include good Arriba at 78s., Machala 74s., and Caraquez 76s.

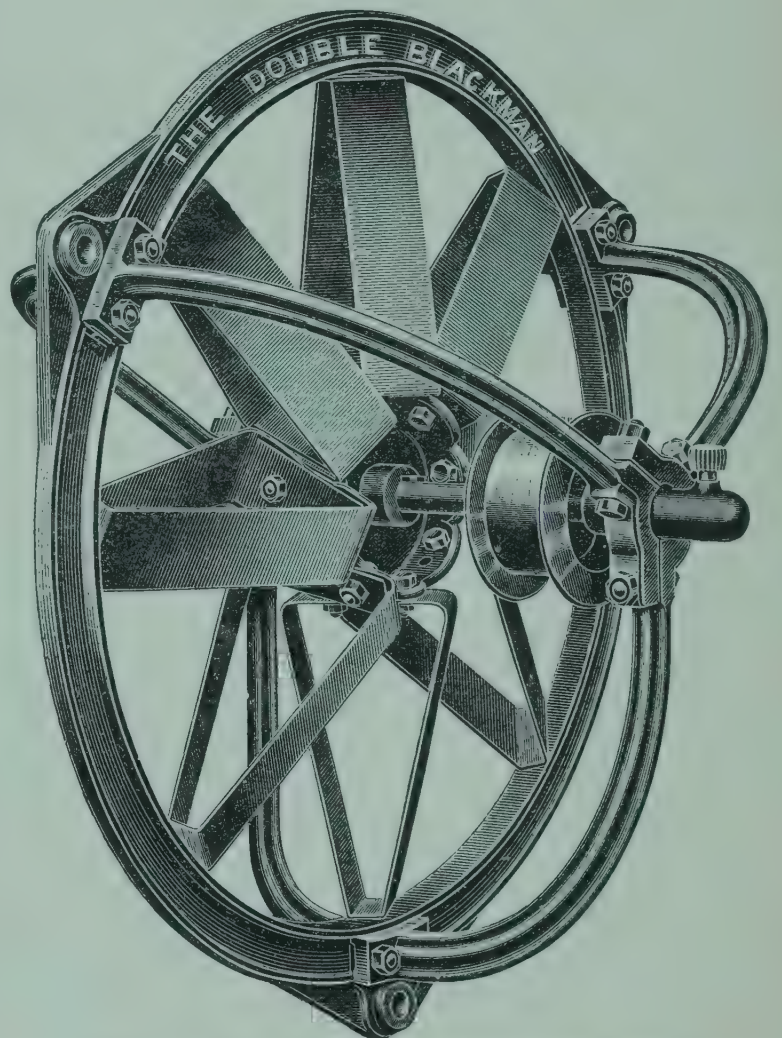
Bahias are valued at 66s. to 69s. against German Cameroons at 68s. to 69s., and San Thomé 66s. to 68s.

Ceylons are selling at increasing rates for estate kinds. On April 8th good bold 84s. to 84s. 6d., ordinary unfermented to fair fermented 70s. to 80s., but on 15th ordinary to fair medium realized 73s. to 82s., and good to fine bold 84s. to 86s., being a further rise of 2s. per cwt.

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International Rubber and Allied Industries Exhibition.

INTERNATIONAL COTTON, FIBRES, AND OTHER TROPICAL AGRICULTURAL PRODUCTS EXHIBITION.

IN addition to the following who have become Vice-Presidents (the Earl of Derby, G.C.V.O., President of the British Cotton Growing Association; the Earl of Selborne, K.G.; Field-Marshal Viscount Kitchener of Khartoum; the Earl of Denbigh, C.V.O.; the Earl of Scarbrough, K.C.B., Chairman of the Niger Co.; and Lord Elphinstone) the following Governors of British and foreign countries have given the Exhibitions their patronage by joining the Committee:—

Governors: His Excellency Sir Frederick Lugard, G.C.M.G., D.S.O., Governor of Northern and Southern Nigeria; His Excellency Sir Walter Egerton, K.C.M.G., Governor of British Guiana; His Excellency Lieut.-Col. Sir Henry Lionel Galway, K.C.M.G., D.S.O., Governor and Commander-in-Chief, British Gambia; His Excellency Sir Edward Marsh Merewether, K.C.V.O., C.M.G., Governor and Commander-in-Chief, Sierra Leone; His Excellency Lieut.-General Sir George Mackworth Bullock, K.C.B., Governor and Commander-in-Chief, Bermuda Islands; His Excellency Colonel Jackson Pasha, C.B., Governor of Dingola, Sudan, Egypt; His Excellency Captain Savile, Governor of Kordofan, Sudan, Egypt; His Excellency Lieut.-Colonel C. R. M. O'Brien, C.M.G., Governor of the Seychelles; His Excellency Edward J. Cameron, Esq., C.M.G., Administrator and Colonial Secretary, St. Lucia, British West Indies; His Excellency H. Conway Belfield, Esq., C.M.G., Governor of Nairobi, British East Africa; His Excellency Monsieur W. Ponty, Governor of French Occidental Africa; Governor W. Cameron Forbes, Philippine Islands; Governor Geo. W. P. Hunt, Arizona, U.S.A.; His Excellency Major John R. Chancellor, C.M.G., D.S.O., Governor and Commander-in-Chief, Mauritius.

The Director of Agriculture of nearly every tropical and sub-tropical country has also joined the Committee, which now consists of six hundred names of gentlemen connected with the rubber and other agricultural industries in all parts of the world.

A number of British and foreign Governments have already intimated their intention of taking part by exhibiting.

Prospectus and plans of the Exhibitions will be ready in about six weeks' time.

The Congress will be the most important that has been, or is likely to be, held for many years, embracing, as it will: (1) the International Conference of

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Tropical Agriculture; (2) the Fourth International Rubber and Allied Industries Conference, at which official delegates and others from all countries, producing and manufacturing, will be present. London is undoubtedly the right centre for conferences such as these; it is neutral ground, and June is the most convenient time of the year for distant friends to meet, as so many are then on leave. Further, London is convenient as a meeting-place for residents of America and all parts of Europe, and this fact has been emphasized by the large number of letters that Mr. A. Staines Manders has received from all countries advising him of their intention to be present, and it will be some five years before another such Exhibition and Conference will be held again in England.

The following cable appears in *Le Bresil*, Paris, April 27th, 1913:—

“Commissions have been formed in view of the participation of Brazil, especially the States of Pará and Amazonas, in the Fourth International Rubber Exhibition, which will take place in London in June of 1914.”

At a meeting of the Central Union of German Rubber Goods Manufacturers, held at the Kaiserhof Hotel, Berlin, on May 3rd, the participation of Germany at the coming Rubber Exhibition was unanimously voted for. The resolution was proposed by Mr. Louis Hoff, the President of the Union, and seconded by Mr. S. Seligmann, Continental Caoutchouc and Gutta-percha Co., Hanover.

Coco-nuts and their Yield.

THE ADVANTAGES OF MANURE.

REGARDING actual yields of coco-nut palms, we see that the Kirivaula Coco-nut Plantation obtained 241,206 nuts from 7,591 trees, or an average of 32 nuts per tree, as compared with 44 nuts in 1911. This falling off, instead of an increase, was entirely due to the extreme drought that had been experienced, and had it not been for the manuring operations of the two previous years, Kirivaula would have done even worse. It is interesting further to note that out of the 241,206 nuts obtained, 31,666 made 22 candies (candy = 560 lb., or 5 cwt.) and 150 lb. copra, which realized an average nett price of Rs. 85.14 per candy; 107,870 nuts were sold at a nett average price of Rs. 55.14 cents (Rs. 1s. 4d., 100 cents to the rupee); 5,000 nuts were planted; 6,670 were rejections (about $2\frac{1}{2}$ per cent.).

This accounts for only 161,206 nuts, so possibly some of the figures are incorrect; for instance, if 197,870 nuts had been sold, and not 107,870 as stated, that would make up the 241,206 nuts plucked. The details given show, however, how a crop is divided up. The management of this company further report that during 1912 the bearing and blossoming palms on the portion of the estate south of the Deduruoya River were manured and good results are expected. It is proposed to deal with the trees on the north of the river in the current year. Buffaloes have also been used for manuring purposes by tying them to trees at night. Regarding the portion of the estate manured in 1912, the Visiting Agent, in his December Report, writes: “The older palms are much finer now than

they were a year ago, and their crowns have developed very much. There is no sign of any yellow about them and given an adherence to the present programme of manure I am sure these trees will yield heavy crops in the future.” Supplying has again been rather disappointing, and white ants have done damage to the young plants put out, but by putting in older plants, and with the use of “Kainit” with supplies, it is hoped to get over this difficulty during the current year. Digging round palms continues to be done, and in general the condition of the estate is satisfactory.

The coco-nut crop of the Jambulande Tea and Rubber Company (Ceylon) was also below the estimate on account of the unfavourable weather.

The Hon. W. H. Figg, speaking as Chairman of the Coco-nut Estates of Perak, of which company Mr. Kelway Bamber is also a director, said those present “would understand that to give details of the working of a place at such a distance and practically in a new district, was somewhat difficult. Means of communication were not easy and the management of coolies in a new district was a matter of trouble. The opening up of the Bagan-Datoh district was a pioneering enterprise, and taking all the facts into consideration he thought the shareholders might be satisfied with what had been done. Personally he believed that having accomplished the draining and the satisfactory planting of the 4,500 acres they had a very sound investment at quite a reasonable cost. Some shareholders had asked what would be the ultimate cost per acre. In the prospectus they anticipated that it would be possible to bring it to the producing stage for £20 an acre. In consequence, however, of the competition for labour, &c., it might come to one or two pounds more. In any case it seemed to him that it would be possible for a matter of £25 per acre inclusive of the purchase of the land to complete the work they had in hand. To have successful clearings at £25 per acre in a good situation, and with such a soil as they had in the Bagan-Datoh district, was, it seemed to him, as good an investment as anyone could wish to have.”

WE see by the report of the Java Pará Rubber Company that this Company has gone in pretty extensively for planting robusta coffee between their rubber. “No less than 696 Colonial tons of coffee had been realized,” the Chairman (Major Frank Johnson) told the shareholders, and he then pointed out that this was equal to an output of 217,000 lb. of rubber at present prices. This output of coffee was derived from only 750 acres, out of the 2,061 under robusta coffee, and represented a yield of eleven piculs (133½ lb. each) per acre, and an additional 265 acres were expected to come into bearing during the current year. The average price realized last year was £3 10s. 9d. per picul, and the greater part of the current year's crop had been sold forward at no less than £3 15s. per picul. When all the robusta coffee on the estate was in bearing, assuming the yield to equal that of the past year, the output should be well over 20,000 piculs per annum.

Drying by the Acre.—Part VIII.

(Or Part X, counting February and March (1912) as Parts I and II.)

MAY I describe, writes Mr. J. Darnley Taylor (who everybody knows, is the able London representative of Messrs. Francis Shaw and Co., Ltd.), what I believe might be an efficient dryer for copra. The apparatus to be described is at present at work on large banana plantations in Brazil, and I understand it is far and away the best method introduced as yet for that purpose, as it carries out the work rapidly and at a low temperature, thus retaining the essential oils and aroma, whilst it costs comparatively little for the power and labour to run it.

The system is based on the principle of drying by means of dried fresh air which has been heated as little as possible. The apparatus necessary is constructed in the form of cupboards, which are arranged in such a manner that the strongest possible current of air cannot in any way damage the materials being dried, as there are means provided for preventing any pressure of air. Any size of dryer can be constructed according to the space available.

The materials to be dried are placed on trays or frames made of wood or wire netting. In the case of copra, perhaps it would be possible to place about twenty-five half nuts, as a single layer, on a tray measuring 3 ft. long by 1 ft. 6 in. wide, and in a stove measuring over all 25 ft. long by 15 ft. wide by 10 ft. high it is calculated to be possible to dry about 45,000 half nuts per charge. These figures are based on the assumption that one half nut would occupy a space of 5 in. by 5 in.

One of the features of this system is that it is not necessary to fill the stove before commencing the drying operation. The attendants can be charging or discharging at any time, but, naturally, better and more rapid results are obtained when the stove is fully charged and the doors closed. It might, therefore, be advisable to construct the dryers in series of expanded sets type, either adjoining or superimposed. The rapid circulation of the air is caused by means of a fan placed in the stove at the back, and driven by belting from a pulley on the fan shafting placed immediately outside the stove.

The fan causes a constant, even current of fresh air to be drawn through the ventilators fixed at the back of the stove, and as soon as it has got through the fan into the stove proper, it is there heated to any required temperature by means of the hot water or steam radiator circulating system, placed on the floor of the stove. The air is then both drawn and blown through the many shelves containing the materials to be dried, and during its course becomes fully charged with moisture, but not until it has absorbed as much moisture as it can hold is it allowed to escape to the open atmosphere through the ventilators fixed in the front of the stove. By this system the makers think it would be possible to dry the copra in a period of from two to four hours, according to the surrounding meteorological conditions.

The cost of running the plant would be very small, as 1-H.P. would be quite sufficient to drive the fan. Labour would be the chief item of cost, but two men would easily be able to work one stove of the size mentioned above. The price of this size of stove would be about £200 f.o.b. Providing you employed the services of a couple of good carpenters, it could be erected in a few days in any part of the world.

Mr. Taylor's notes remind us that, as a result of the publication of his article in our March issue, we have received several letters criticizing his remarks and continuing the discussion, amongst them being these two:—

"I have read with interest the article on Drying on Plantations in your March issue. From the remarks made in the opening paragraphs your correspondent apparently considers that vacuum drying is now the only feasible method of drying large quantities of rubber on the plantations, and as he dismisses the use of air-drying with a few general statements, I should like to show by means of facts and figures just exactly what can be done with a properly equipped hot-air drying installation, and to show that, apart from any questions of the high initial cost of vacuum dryers, and of their more or less intricate mechanism (bearing in mind that coolies have to work them), air drying properly carried out is eminently suitable and convenient for the largest outputs of rubber. I might add that I base my remarks upon actual experiments and observation on plantations. There are two general methods of drying rubber by hot air which are open to planters. The first consists of drying large "batches" at a time in suitably arranged drying lofts at a temperature of about 110° F., and taking several days to complete the drying. The second method is that of drying small quantities at a time in small confined chambers or ovens working at a temperature in the neighbourhood of 170° F., and occupying only a few hours for the process.

The former method is the most simple and efficient, and by it the rubber cannot possibly be over-dried, except by the sheerest carelessness. The second method has the advantage of being handy and occupying small space in a factory, but requires a certain amount of care to prevent over-drying.

Taking first the method of drying by hot air in drying rooms or lofts, the method introduced by the makers of the "Chula" drying room installation is considered by many to be the handiest and most easily worked arrangement, and I will briefly describe it. Taking as an example a room or loft 60 ft. by 30 ft. by 10 ft. to ceiling, this, by the "Chula" arrangement, would be divided into, say, four compartments, by means of rough weather boarding, each compartment having a simple sliding door for access from a passage-way running the length of the room. One or two small sliding trap doors in the ceiling of each compartment, and a swing window (painted) or swing shutter for light and ventilation when required, complete the general arrangement. For hanging the rubber the poles are arranged about 4 in. apart and in three tiers with about 2 ft. 6 in. space between. These ranges of poles are subdivided by two narrow passages, so that in hanging or removing the rubber the coolie has not to reach more than about three feet from the end of each pole. The "Chula" hot air installation consists essentially of a large air-heater of a special design, the hot air from which is delivered by a powerful fan to the drying compartments, and is distributed to them by a system of light galvanized steel piping fitted with numerous outlets, each controlled by a sliding shutter to give even distribution of air. Simple valves are arranged to cut off the air supply entirely from any compartment without

interfering in any way with the process in the others. In practice the general procedure is to hang up one day's production of sheet or crêpe in one compartment, close door and window, and turn on the air. The compartment soon fills with hot air at a slight pressure, the trap doors in the ceiling being previously set to give a slight discharge, and so maintain a circulation of air. The next day's production of rubber is hung in the next compartment without interfering in any way with the process in the first compartment. This goes on until the fifth day, when the dried rubber in the first compartment is taken out in the morning ready for a new charge of rubber later in the day. The process is thus a continuous one, and once started, a day's production of rubber is turned out fully dried *every day*.

The actual capacity of one of these compartments varies, of course, with the form in which the rubber is dried. The greatest output can thus be obtained, as in any form of dryer, with thin crêpe or lace rubber, to be re-pressed and bulked into thick blanket crêpe when taken from the drying room and while still warm. In a drying room two days is ample time for drying rubber in this form. Thicker crêpe or sheet to be shipped in the form in which it is dried should take the full four days to dry, and while if the total out-turn is somewhat less, the absence of extra handling and re-rolling compensates for it. To state the capacity in figures, using moderately thin crêpe or sheet, one of the compartments such as I have described has a minimum capacity of 1,500 lb. of dried rubber; that is, the capacity of a drying room 60 ft. by 30 ft. arranged in the manner described is at least 1,500 lb. *per day*, or, say, 400,000 lb. *per annum*.

To come to the second method of hot-air drying, that of separate small drying chambers or ovens made of steel plates, and fitted with expanded metal trays for holding the rubber (these dryers are, in fact, very similar in appearance to vacuum dryers), the drying process in such chambers is exactly similar to that which I have described in connection with the "Chula" drying installation, except that higher temperatures and stronger air draught is used, thereby giving the rapid drying of small quantities at a time. It may surprise many of your readers to know that thin lace crêpe from first latex can be dried at about 175° F. in a little over an hour, and that a simple chamber has a capacity of 30 to 40 lb. per hour. When taken out of the dryer the rubber is certainly soft, but not really "tacky," and after being pressed or bulked into thick blanket and hung in a cool dark part of the factory, it very soon hardens off.

One make of these small hot air dryers is known as the "C.C.C. Rubber Dryer," and another is the "'Chula' Hot Air Chamber Dryer," both being made by the firm who supplies the drying room installation such as I have described.

In conclusion, I might draw attention to the fact that whatever method of drying is adopted on a plantation the rubber itself—especially crêpe—should be very carefully rolled to get it even and to ensure equal drying. The thick edges or beads found on crêpe often remain virgin long after the bulk is dried, and if the white bits are dried out the bulk becomes over-dried. To avoid this difficulty the washing mills

should be run at the lowest speed given by the makers, and when the crêpe is passing through the rolls it should be pulled backwards by the hand in order to put a good strain on it, and also to carefully guide it away from the sides of the rolls.—Yours faithfully, "O. E."

Here is another letter:—

I have read with interest the article on page 42 of your March issue. Would it not have been a good opportunity to have stated that the vacuum dryers referred to were "Passburgs," as this was not mentioned; also that since March last this firm has shipped over fifty Passburg dryers to the East, besides an order for a double-plant, capable of dealing with over 400,000 lb. of washed rubber per annum, and what is more to the point, the buyers are paying the *full price for same*?

A Passburg vacuum drying installation has been ordered for a Malay plantation, with a capacity of about 500 tons of washed rubber per annum, the plant being arranged for extensions as later required. This makes the sixth repeat order received from the same group within as many months.—Yours truly, "D. C."

Spraying Operations in London.

EXTERMINATION OF CATERPILLARS IN RICHMOND PARK.

RESIDENTS in London who wished to see practical demonstrations of spraying machines applying insecticides on a large scale, have had splendid opportunities of doing so, as a squad of men, under the guidance of Professor Maxwell Lefroy, who now occupies a leading position at the Imperial College of Science and Technology, South Kensington, has been busily employed in utilizing a powerful petrol-driven sprayer to dislodge and exterminate the great plague of caterpillars that again attacked the trees, especially the young oaks in Richmond Park, more particularly around Ham Cross. The fluid used was a compound prescribed by Professor Lefroy, and included lead chromate in solution, which dries quickly, and once dry, it is not dissolved by the rain, so remains to poison the caterpillars. The lower half of the trees was, we believe, done first, and then, what resembled fire-brigade carriage-ladders, were called into use for the upper portions. The spraying machine, although portable, had to be moved, comparatively speaking, but very little; long lengths of flexible hose being used. These radiated from a junction supply pipe of metal, in such a way as to allow six sprayers to be used at one time, in the same way as the apparatus of Messrs. Wm. Weeks and Sons, which we described and illustrated in our "Soil and Plant Sanitation" book, pp. 518-520.

So mischievous had the caterpillar pest become that it was estimated that the trees attacked were 40 per cent. deficient, and in some cases their tops were dead. The London press published long illustrated notices of the whole affair, which undoubtedly constituted the largest spraying operations ever carried on in this country. Professor Maxwell Lefroy, whose name, of course, is well known in rubber and tropical planting circles, is to be congratulated on the results of his labours on this side, as he has been for his work in connection with agriculture in the Tropics.

The Spraying Machine in Agriculture.

AS soon as space and opportunity permit we hope to start a series of articles on tobacco growing; meanwhile we produce below a photograph that was published in the pages of our contemporary, *The Australian Sugar Journal* of February 6th, showing how the application of water by a spraying apparatus, as we have suggested for some years past, is being utilized in at least one case. We feel certain that even on rubber, cacao, and other estates, some such methods should prevail to counteract the effects of drought; at times a little insecticide or fungicide mixture could be added, as by doing so such pests would at least be discouraged if not got rid of entirely. Again, with nozzles fitting on both sides of the tubing, artificial manures could be applied to tea bushes, cotton plants, &c., for even basic slag, although insoluble, is so finely ground that by agitating the liquid (as milkmen have to do in London to distribute the cream and not let it collect on the top only) it can be held in suspension as with whitewash, and so pass out with the soluble fertilizers and be evenly distributed to the trees or plants on either side. Such uses, and others that are certain to arise as more intensivesystems of cultivation are introduced on the estates, will enormously increase the demand for apparatus capable of supplying and applying water and other liquids to the soil, or to the trees and shrubs covering it, as required. The idea that water-ejecting machines generally known as sprayers are only good for the extermination of pests is quite erroneous, and if the makers of such apparatus were as anxious to sell their machines as we are to see them in use, sales would already be twice and three times as great as they are. Ever since TROPICAL LIFE first started in 1905, we have been keen advocates of the use of hand and power spraying apparatus, as we knew even then what a market there is for them throughout the Tropics, but the makers whom we interviewed or wrote to on the matter seemed in many cases, as they are even to-day, to be unaware of the markets that await them overseas. The way makers of spraying machines are neglecting our own colony of the Gold Coast is proof positive of this. Since the Coomassie Show, held there in 1908, when we wrote to a dozen different makers to send out machines to be shown to and demonstrated on before the natives, and then probably sold, hundreds of machines could have been placed to the advantage both of the planters and makers alike, and yet not a single maker had the enterprise or knowledge of the market to send out a sample machine. This is all the more sur-



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Spraying System of Irrigation as applied to Tobacco Growing.

prising when freight, exhibition space, and demonstrations were, so far as we can remember, offered free to exhibitors. The utmost risk they ran was the loss of a machine, which would not have been worth consideration, especially as there was no reason to foresee such an accident. We hope and believe to-day, with the increasing number of makers of these most necessary appliances in modern tropical agriculture, that the firms making these useful appliances will pay more heed to the extensive trade that awaits those willing to go forth and seek it out.

This opinion is confirmed by the American Consular Report (we believe by Mr. Vice-Consul Alexander) issued last December, to which we drew attention last month (p. 53), but did not then have room to state that the report went on to say that on practically every rubber estate in the Federated Malay States not one but several spraying machines are in constant use, both for spraying the rubber trees, and for spraying and killing the lalang or other weeds. Two or more types are used; the larger ones, for tree work, are mounted upon small trucks drawn

by coolies or animals, whilst on the hillside knapsack machines are used. It was the knowledge of this which induced us to offer two medals at the coming Tropical Exhibition, viz., one for hand and one for power spraying machines.

The January issue of the *Agriculture Journal of the Pusa Institute* contains an important

illustrated report, covering twenty-six pages, on the damage done by the *Psylla* insect to the Behar indigo crop and the resultant loss to planters. Mr. Maxwell Lefroy, M.A., whose name appears opposite, drew up the report and suggested spraying as a remedy, especially on plants kept for seed. This was tried and gave good results. It is worth noting that this authority found the compressed air type of sprayer to be the simplest for field use, and the best adapted to the physique of the Behar coolie. This opinion we know is not shared by all, but at the same time it is worth noting. Full particulars as to cost of spraying, and the benefits derived are given in the Pusa journal mentioned, pages 1 to 26. The report is worth studying by planters in India and other centres troubled with pests on a large scale.

We have always attached great importance to the possibilities of spraying apparatus as a means of applying irrigation water to the soil when it is required to do so over the surface with certain crops, or in nurseries, and when preparing seed beds, &c. The top soil could then be turned in with a plough or cultivator, and by forming a mulch keep the moisture down in the soil for some time.

INDIAN TEA ASSOCIATION NOTES.

The Utilization of Tea-Seed for
Soap-making, &c.

ACCORDING to the *Indian Trade Journal* tea-seed oil has been long in use in China as a table and lamp oil, and in the manufacture of soap, for which it is especially adapted, yielding, as it does, an excellent hard and white product. The expressed oil is said to contain a proportion of saponin that renders it somewhat unsafe for human consumption; but the oil obtained by extraction with solvents is perfectly free from saponin. Of China and Assam tea-seed, the former yields 30 to 35 per cent., and the latter 43 to 45 per cent. of oil, which is straw or amber-coloured, resembling olive-oil, but with a more or less acrid taste. The cake possesses only 1.92 per cent. nitrogen and 0.58 per cent. of phosphoric acid. As a manure, therefore, its value is not great, and would be confined entirely to local application to avoid cost of transport.

From notes collected *re* the utilization of tea-seed for oil, we see that it is recognized by a leading firm of soap-makers in England that tea-seed oil is valuable for soap-making, but so far it has not been obtainable in large quantities; this firm is, however, quite familiar with the oil, and with its prospects for the future. Sir George Watt, in his "Economic Products of India," tells us, in the section devoted to tea, that "it has often been upheld that the seeds, being rich in oil, might be systematically collected and sold by the planters as an additional source of revenue." So far, however, nothing seems to have been done in this way, although the seeds would surely be less trouble to collect than coffee-berries, and the proportion of kernel to shell is a heavy one. Mr. Robert Middleton, Oil Machinery Engineer, of Leeds, who has evidently watched the seed and its oil, tells us that he has not heard of its being used in this country, but confirms its use in China as a table (*i.e.*, for consumption) and lamp oil as well as for making soap. He describes the oil as being thinly fluid, tasteless, inodorous, of a straw to amber colour resembling olive oil. Specific gravity at 59° F., .927. At 39° F. it forms an emulsion, and solidifies only below 23° F.

The *Bulletin of the Imperial Institute*, which seems to pay special attention to these neglected by-products from the Tropics, published some useful particulars in its July (1912) issue, pp. 234-235, on tea-seed oil, from the *C. sasanqua* (a near relative of *C. thea*), which, we are told, is mainly cultivated by the Chinese for the sake of its seeds, from which oil is expressed and used as an illuminant.

According to Watt, *C. japonica*, including *C. sasanqua*, is the cultivated or garden camellia, and if this is so, then probably *C. sasanqua* is not grown to utilize the leaves for commercial tea, and this agrees with what the Imperial Institute says about its being cultivated mainly, if not entirely, for the oil. Freed of its oil, the cake is used as a substitute for soap, probably on account of the large amount of saponin (7 to 8 per cent.) in it; it cannot, on this account, be used for a feeding cake, but might be used as a vermicide to dress lawns. It is described as being of a dark brown colour, and as possessing an unpleasant, pungent, bitter taste. Its analysis is as follows:—

	Per cent
Moisture	8.33
Crude proteins	6.49
True proteins	6.13
Other nitrogenous substances	0.36
Fat	1.31
Starch, &c... ..	43.24
Fibre	37.43
Ash	3.20

The oil (*C. sasanqua*), still quoting the *Imperial Institute Bulletin*, was yellowish brown, slightly opalescent, and said to have come from the Kwangsi Province. It analysed thus (in comparison with Mr. Middleton's details already given, which, we take it, refers to the seed of *C. thea*):—

Specific gravity at 15.5° C.	...	...	...	0.918
Acid value* ... ..	...	...	...	9.4
Saponification value* ... ..	...	...	...	193.4
Iodine value, per cent....	...	...	...	87.5

* Milligrams of potassium hydroxide per gramme of oil.

The oil was valued (February, 1912) at 20s. per ton less than cotton-seed oil, then worth £22 2s. 6d. per ton in Hull, but now (May 10th) worth £26 to £27. Such oil would find a market here for lubricating and soap-making purposes. *C. thea* oil in India, therefore, with an oil content up to 45 per cent. ought surely to be worth collecting and utilizing as an article of transport, together with rubber seed-oil* from elsewhere.

Leaving the oil and coming to the question of selling the leaves, we have to report that the season is rapidly waning, and within a few weeks the whole of the Indian crop will have been disposed of. The London market has of late shown an active demand for all teas with cup and fair appearance at firmer values, and prospects point to a strong market for the commencement of the coming season, provided that quality is not sacrificed for quantity.

Weather reports from the tea districts to hand are to the effect that the early rainfall has been good, and manufacture should soon become general and continuous.

Budget resolutions were under consideration in the House of Commons on May 7th, and the Chancellor of the Exchequer, while expressing regret that it was necessary to re-impose the full duty on tea, indicated that no relief could be expected at the end of the current financial year. His estimates of additional revenue from the tea duty were criticized, and trade opinions were reflected in the House by some speakers on the optimistic basis upon which these estimates are formed.†

The Board of Trade Returns for April show that trade generally in the United Kingdom was phenomenally good, and even after allowance is made for two clear working days more than last year, the figures are indicative of much industrial activity. The statistics relative to movements of tea may be considered very good. Deliveries and re-exports increased by 4½ million pounds, and the total stocks were only 3¼ million pounds in excess of last year.

Continued activity and hardening prices, report

* See TROPICAL LIFE for April, 1912, p. 72.

† See our leading article p. 91 (written before we had these notes) on this policy of "all take and no give."

Messrs. W. J. and H. Thompson, have been the features during the past week and buying has been conducted with unabated confidence. The concluding sales of Indian tea for the season have indicated a strong and healthy position, and prices have shown a marked recovery for all descriptions except lowest qualities. Ceylons and Javas have also participated in the keen demand, any movement in prices being, as a rule, in seller's favour. One more fair-sized sale after Whitsun week will practically close the Indian selling season. Supplies meanwhile are rapidly diminishing, so that the light offerings put up for sale were well received and a buoyant tone prevailed. Active competition was extended to all grades and qualities with the exception of the lowest grades and unsightly stalky kinds, and tea generally may be quoted as firm to $\frac{1}{4}$ d. per lb. dearer; demand was particularly strong between $8\frac{1}{2}$ d. to 10d. per lb., whole-leaf grades reflecting brisk competition under export orders. Good clean common whole-leaf is selling readily at $7\frac{1}{4}$ d. to $7\frac{1}{2}$ d. per lb. All important buying houses have entered the market freely. The average for the whole sale, during the week ending May 10th, on Garden Account was $8\frac{1}{2}$ d. per lb., compared with $8\frac{3}{4}$ d. per lb. a year ago, whilst the average for Ceylon was $9\frac{1}{4}$ d., compared with $9\frac{1}{2}$ d. per lb. last year.

The Government of India have renewed the Cess Act for a further period of five years, and the allocation of funds by the Calcutta Committee is as follows: To work in America, £15,000; on the Continent, £5,000; for the United Kingdom, £6,000; for India, £1,000; and for special work connected with cinematograph films, £1,000.

The annual Assam Tea Planters' dinner will be held on Tuesday, June 3rd, in the King's Hall of the Holborn Restaurant. The chair will be taken by Mr. H. S. Ashton, Chairman of the Indian Tea Association (London). There is certain to be a full attendance. We hope that the question of labour supplies may be touched upon in the speeches, if only to make the public here (whose only trouble is to get the tea to sell and to drink) realize that, whilst any old woman or child of five can buy tea and drink it, the most experienced planter is not always successful in producing it to pay, and with the rival competition of rubber, &c., for labour supplies, the lot of the Indian tea-planter like that of the tropical and sub-tropical tea-planter, like that of the tropical and sub-tropical cotton planter,* will not, we fear, grow easier as time goes on. The sooner, therefore, the public who consume the tea are taught to realize that they will have to pay more or go without, the better for planter and public alike.

It is with extreme regret that we have to announce the death, on May 10th, of Mr. George Mordaunt, who, previous to his death, was senior partner in the firm of Messrs. Mordaunt Bros. for fifty-five years.

The business will be carried on under the same style as before by the remaining partners, Messrs. Francis George and Edgar Henry Mordaunt.

Reviews.

THE PREPARATION OF PLANTATION PARA RUBBER. According to B. J. Eaton, F.I.C., F.C.S.,* Agricultural Chemist, Department of Agriculture, Federated Malay States.

THIS bulletin runs into 58 pages, but contains more useful information than some books of five and ten times the size. It is simply a statement of the author's opinions on the collection and preparation of hevea latex from start to finish, with details of the various pitfalls that waylay the precious article through different stages of its career to darken its character and spoil its reputation. Such a pitfall is discussed on p. 23, regarding the darkening effect that iron salts, in the shape of rust, have upon raw rubber, when the value of absolute cleanliness is impressed upon the planter, together with the advantages, when tapping, of using non-metal cups, such as those made of glazed earthenware, porcelain or glass. This causes us again to wonder whether the rollers of the washing machines should not also be made of a non-metal (except perchance brass or aluminium; but they cost money), such as granite, granite-ware, &c., such material not being liable to rust. After discussing tapping, and going into very full details about coagulation, accompanied by a long list of the various acids, the quantities to use, and their effects and defects, which to choose and which to avoid, the effect of sunlight on rubber is discussed, and the darkening or oxidation of rubber, and how to prevent it, is explained. Then we come to moulds and bacteria, and here our contentions as to the benefits of the drying fan on estates are confirmed, for we read that "smoking darkens the rubber, and is useless where pale unsmoked crêpe is required." The main principle of good drying, and hence the prevention of moulds and bacteria, should be to dry rapidly at the lowest possible temperature.

At the present time many drying houses on estates are unsatisfactory, and the air in the interior is often very stagnant. Some method of more rapid circulation of air through a drying room, either by an exhaust fan or by a forced draught, is essential, as in this way the moist air is continually removed and replaced by drier air. To prevent moulds forming and spreading we are told that great care should also be taken not to hang the rubber close enough together to cause the sheets to come into contact with each other. With smoke-houses, a small truck on wheels, made as low as possible, is recommended (p. 41). This favours the Byrne system in many points, as lack of dust, thick and even smoking, &c., a large number of small furnaces being preferable to one large installation. "Furnaces" should not be allowed to burst into flames but should quietly smoulder, in order to produce the maximum amount of smoke. A further advantage of smoking is the rapidity with which the rubber dries, so that much smaller storing room is required.

"The most essential precaution in any smoke-house," we are told, "is to maintain the temperature below a maximum of about 110° F., since, if the rubber is dried

* The question of the supply of a sufficient amount of labour faces the cotton grower in almost every country, and is one to which attention should be directed (Sir W. Willcocks in his book on the "The Irrigation of Mesopotamia").

* Being Bulletin No. 17 issued by the Department of Agriculture, Kuala Lumpur, Federated Malay States. Price 7d. post free. London Agents, The Malay States Information Agency: 88, Cannon St., E.C.

at a higher temperature, tackiness occurs and the rubber deteriorates." Other conditions being equal, sheet rubber is superior to crêpe as the former possesses superior physical qualities over the latter. On estates with a large output the latex should not be coagulated in small pans, but in large vessels, preferably of glazed earthenware holding 40 to 50 gallons each so as to ensure a uniform standard being obtained.* Large shallow boxes of wood, capable of being divided into compartments by movable partitions, are recommended in preference to small coagulating pans. Certainly we have here a bulletin well worth studying.

WE are glad to see that the "V. S." syndicate has issued a new edition of "VERB. SAP.,"† that useful publication that has come to be recognized as the first item to be purchased by those setting forth for the Tropics, whether West Africa or elsewhere, the next three items being a filter, mosquito netting, and quinine. Increased interest will be attracted to the book on account of the new features introduced, whilst, needless to say, all the old ones have been brought thoroughly up to date. The present edition contains a special chapter on Health, which has been approved by authority, whilst further notes have been contributed by leading authorities, including a senior nursing sister of the Colonial Nursing Association. Ladies going out to the Coast, or elsewhere in the Tropics, especially for the first time, will find they have not been forgotten, whilst, of course, many pages are equally useful to both sexes. All going out to Africa need such a book, and should study it carefully before buying their outfit, as by doing so both their health and their pockets will benefit. We say this as full details are included in the various lists given of outfits, clothing, &c., that are needed by the various travellers, official, civil, medical, nursing, &c., the uniforms, clothing &c., required by each will all be found, down to needles, pins, fountain-pen, ink, &c. It will be wise, therefore, to look through this list before doing anything. Following these particulars, we have the voyage out, the landing at the ports, the journeys up-country, and then life generally is described. Those who, like ourselves, have had close experience with coloured races, negro, Chinese, East Indians, &c., as well as poor whites, and the *olla podrida* of all these races mixed up together, can vouch for the correctness and utility of the information given; keep taut, no slacking, go slow, but go on. "Che va piano, va sano," starts Chapter IV. on "Life and Social Amenities," and such advice is worth remembering and following. That the life is not altogether bad is shown by the concluding words of Miss J. Oram, who contributed a special section for Nursing Sisters, when she says: "To all newcomers I can give no better wish than that they may be as well and happy there as I am." Miss Oram speaks well of Messrs. Elder Dempster and Co., and their generosity for taking out stores, &c., for the nursing

sisters free—"which I for one appreciate more than I can say," she adds. As in former editions, the book concludes with a very useful "Who's Where," and their addresses or stations on the Coast.

"NITRATE FACTS AND FIGURES," by Mr. Brodie James, F.S.S. (Price 2s. 6d. net. Fred C. Mathieson and Sons, 16, Copthall Avenue, London, E.C.)

This interesting little book has just come to hand, and although we do not pretend to much knowledge in either nitrate statistics or nitrate shares and therefore gratefully accept the figures of Mr. Brodie James on these points, yet the preface to the book strikes us as being somewhat pessimistic in tone. We do know a little about tropical and other crops, and also about fertilizers, and we are certain that the demand for nitrogenous, together with other fertilizers, will increase enormously all over the world in the next few years, and the fact that the consumption of nitrate of soda alone has increased very rapidly during the past four or five years goes to support this view. We notice in some statistics which we have by us, *viz.*, Messrs. Henry Bath and Son's circular for 1912, that in 1908 the world's consumption was 1,733,000 tons, whilst in 1912 the figures were 2,486,000 tons, an increase of some 44 per cent. in four years! The various agricultural authorities throughout the world have long been alive to the fact, and are, at last, inducing the planters to be the same, that there is not nearly enough farm or stable manure to go round, and yet, unless heavier crops are grown, there will soon not be enough food to feed the world; hence an increased and increasing demand for fertilizers must be faced by buyers and sellers alike. As to the statement at the end of Mr. Brodie James' preface, that "nitrate shares are a wasting asset," we think we understand what is meant to be conveyed, *viz.*, a timely caution that the nitrate deposits, the same as gold, coal, and other minerals, are not inexhaustible. But why say the shares are a wasting asset? No doubt in time the nitrate deposits will be exhausted, but it is conceivable that some companies at least may in due course build up a cash reserve in excess of their present price—if they now stand at a discount—so that the expression shares is hardly strictly correct. However that may be, the implied advice to put aside for a rainy day is excellent, and we sincerely hope and believe, in the interests of the world at large, and of those directly interested, that there are yet many years of prosperity in store for the nitrate industry to the advantage of shareholders and planters, *i.e.*, sellers and buyers, alike.

OWING to the increased demand for publicity matter regarding their well-known "Monkey Jacks" and other stump extractors, Messrs. Trewhella Bros., Ltd., have been forced to issue a new and enlarged catalogue illustrating the implements that they make, and giving full particulars of same, with details as how to work them and the advantages accruing from their use. Those interested in the clearing of land, and the laying out of estates, will be well advised to write for a copy of this brochure, which will be sent post free to any part of the world on application to Messrs. Trewhella Bros., Ltd., 6, Alma Street, Smethwick, Birmingham.

* Messrs. Francis Shaw and Co., Ltd., have a special smoke-curing apparatus with such earthenware receptacles to hold the latex whilst being treated. Our issue for July, 1911, includes one of these coagulators showing the porcelain tanks with aluminium fittings.

† Price 2s. 6d. net, or 2s. 10d. post free. 251 pp. with many illustrations, and a special preface by the late Sir Alfred Jones, whose portrait serves as the frontispiece. John Bale, Sons and Danielsson, Ltd., 83-91, Great Titchfield Street, Oxford Street, London, W.

THE April issue of the *Bulletin of the Imperial Institute* contains summaries of recent investigations—mainly of vegetable products—carried out by the scientific and technical staff of the Institute. Among these are interesting reports on samples of beeswax and oil-seeds from the Anglo-Egyptian Sudan, “cheyi” seed and fibre, and a note on the value of “elephant grass” as a paper-making material. Among special articles are an authoritative re-statement of the progress of agriculture in Egypt by the Director-General, Mr. Gerald C. Dudgeon, and an illustrated paper on the pottery industry of Ilorin, in Northern Nigeria. The extent to which fibrous materials are augmenting the limited supply of rags of various textile fabrics in the manufacture of paper-pulp is outlined in an article on the manufacture of paper-pulp for export. The General Notes include reference to sisal-hemp cultivation in German East Africa, recent developments in cotton growing in the United States, cacao from Southern Nigeria, and a note on the agricultural possibilities of the Panama Canal zone. A section of the *Bulletin*, dealing with recent progress in agriculture, gives a summary of the new and important developments in agriculture and planting during the previous quarter.

ACCORDING to the *Queensland Agricultural Journal*: “Taking the cost of white labour (including an overseer) in Queensland, the cost of gathering, husking, and splitting the nuts, extracting and drying the meat, would come to about £18 per ton of copra.” We shall be glad to know how this estimate compares with the cost of preparing copra for shipment elsewhere than in Queensland.

IT has been found in some of the West Indian Islands and in Florida, that certain fungi are parasitic on *Lecanium* and other scales attacking economic plants and trees. Thus stated Mr. J. R. Bovell, I.S.O., F.L.S., &c., at the West Indian Conference, as shown by the report of the paper he read published in the *West Indian Bulletin*, vol. xii, No. 4, of 1912 (price 6d.). Results obtained in Barbados, he concludes by saying, with entomogenous fungi, and from what has been done in Florida, and other places, leads one to hope that as soon as more is learnt of the fungi and the methods of cultivating and spreading them, it will be possible to keep in check most of the insect pests attacking economic and other plants and trees in Barbados. We would add to this important statement of Mr. Bovell’s, that if this is likely to be done in Barbados, it can be done elsewhere, so we trust our readers will secure a copy of this number of the *West Indian Bulletin* from Messrs. Bowen and Sons, Barbados, or Messrs. Dulau and Co., of 37, Soho Square, London, and study the case for themselves. In the second article of this publication, Mr. F. W. South, B.A., confirms Mr. Bovell’s statements, and further adds that some suspected new parasites have been found besides those mentioned in the first article, and experiments carried out with these parasitic fungi tend to show clearly the effects that might be obtained by the full development of the control exercised by these useful fungi.

OUR leading article in the April issue on the urgent

need of extending the area under soya beans, has given great satisfaction to our readers, judging by the letters already to hand. These, of course, cannot yet include any communications from the Tropics, but the following from the Hull Oil Manufacturing Co., Ltd., is typical of those that have come to hand:—

“Your favour received, and the article in the April issue of *TROPICAL LIFE* on soya beans seems to us a particularly good one. It is well written and thoroughly interesting, and should certainly go a very long way in encouraging the planting and producing of soya beans in all parts of the world. We trust it may.”

Economic Zoology.

Our Motto: “Utilization, not Extermination.”

Conducted by FRANK FINN, B.A., Hon. F.Z.S.

OWING to the space given up to the important question of utilizing tea-seed for export, I have been asked to hold over my article intended for this section. This was devoted to the controversy Sir H. H. Johnston is carrying on with the bird-plumage millinery trade, who, in my opinion, rightly claim that there is no destruction of birds for millinery, or other purposes that in any way affect the tsetse-fly pest in Africa. As I have already pointed out, those who want to exterminate the bird-millinery trade run a poor chance of success, whilst many others even of the less fanatical, who wish (as Professor Dewar, the millinery trade, and myself all do) to preserve the birds by organizing their collection, often go the wrong way to work by publishing untrustworthy or incorrect versions. Such a course only prejudices the public and does no good.

Leaving the birds alone, I would like to call the attention of those who are thinking of breeding “cattle under coco-nuts,” to the Report of the Agricultural Research Institute at Pusa for 1911-12, which states that some important work has been carried on in the Chemical Section of the Institute during the year in the endeavour to establish a reliable method of *milk tests for Indian cattle*. When testing cows’ milk in India two sources of error have to be guarded against: (1) If the periods between milking are not equal, the composition of the milk will be influenced, and (2) the calf will take an indefinite amount of milk if this is not controlled. In order to eliminate these sources of error the cows are milked exactly at intervals of twelve hours, and the calf is allowed to take the whole of the milk from only two teats on one side of the udder, the other side being milked by hand and the calf being made to change the side every twenty-four hours. In this way the difficulties described were overcome. While great regularity was, as a rule, obtained in the composition of the milk, yet it was possible to observe characteristic differences. The chief of these was that the percentage of butter fat in the morning was greater than that in the evening milk by 0.5 to 1.5 per cent., and there was no exception to this rule. No systematic difference was found, in the composition of the milk, between the different sides of the udder.*

* See also the *Indian Trade Journal*, from which I have taken this extract.



"Tropical Life" Friend.—No. 95.

MR. C. KEITH BANCROFT, M.A., F.L.S.,

Ex-Government Mycologist, F.M.S., and now Assistant Director of Agriculture and Government Botanist, British Guiana.

IN the long ago, sitting one evening on the deck of the French mailboat, on the way from La Guayra to Carupano, we remember discussing with an English globe-trotter the question, at the time somewhat prominent, of local appointments for local men in the West Indian Islands. Our companion spoke as though he had carefully considered the subject, and his remarks interested us very much; that they made an impression is shown by our recalling the theory he finally expounded before the conversation was switched on to another subject, although it was as long ago as 1891, the Wednesday before Good Friday, that the conversation took place. The date was impressed on our memory on account of the importance attached, or claimed to be attached, by the veriest ragamuffin in Carupano and Caracas, to the next two days from a Roman Catholic's point of view. On Holy Thursday and Good Friday no one would work, so we were boxed up in Carupano for three days—and such days! Fortunately we knew many of the merchants, so made the best of the time, although the delay was not at all to our taste. But to return to the conversation on deck.

"Well," my companion summed up, "I think you will find I am right in surmising that if a man born in these little dependencies wants to rise, he should certainly go to another colony, and the larger the better. In his own island, he is well known, if he is not related to, all the educated people around him. There arises therefore from the Government's point of view the risk of collusion, or of slack work; whilst the difficulty of prosecutions or dismissals, and even of

commanding attention and instilling discipline into juniors is increased. . . . Yes, I agree there are exceptions where local men have done excellent work, but they are only the exceptions that prove the rule."

We repeat the conversation at length, as there may be some truth in it, and we still know young fellows, who object to "the marked favouritism of the Colonial Office" in passing them over for outsiders when the higher and highest berths fall vacant. "Our Friend" this month is a striking example of the success that can attend a capable man even in the early days of his career (but there must be no doubt of the capability), if he possesses sufficient steadiness and confidence in himself to launch out on the world and not stop at home.

Born in Barbados in 1885, "Our Friend" was educated at Harrison College in that go-ahead island, until 1905. During this time he was not idle.* In 1903 he gained the Diploma of Proficiency in Agricultural Sciences, following this two years later by winning the Barbados scholarship of £700. On obtaining this Mr. Bancroft proceeded to England, and entered Trinity College, Cambridge, where he remained until 1908, gaining the Major Scholarship, and being posted Prizeman in 1907 and 1908; to this he added a first class B.A. in Natural Science (1909), and special honours in Botany (1909). Hard things, not always undeserved, have been, and still are, said at times against Crown Colonial Government in general, and of the West Indies in particular; far too little credit, however, is given where due to the lavish way in which Trinidad and Barbados, if not the other Islands, disburse these scholarships of £600 and more, to their best intellects, and thus give them a start in life that anyone, even Kipling's "Duke's Son," might envy. Mr. Keith Bancroft, it will be seen, has shown the advantage of such generosity by proving a credit to Barbados that reared him, and a benefit to the Empire by the work he is doing, and which, we trust, he will long be spared to carry on.

Leaving Cambridge, "Our Friend" proceeded to Kew and studied under Mr. George Masee for two years, devoting his attention principally to tropical mycology, and from Kew he proceeded, in 1910, to take up the post of Assistant Mycologist at Kuala Lumpur (F.M.S.), being appointed Head Mycologist in January, 1912. Readers of TROPICAL LIFE need not be told that Mr. Bancroft's principal work in the F.M.S. has been connected with Pará rubber and coco-nuts, together with their subsidiary crops, and his reports published in the Bulletins of the F.M.S. Department of Agriculture are well known and widely read (also borrowed and not returned), especially those on the fungus enemies of Pará rubber, root disease, "die-back disease," and others on various mycological subjects. It will also be remembered that about three years ago "Our Friend" issued a useful "Handbook of Diseases of West Indian Plants."

As most of our readers now know, Mr. Bancroft has lately been appointed Assistant Director of Agriculture and Government Botanist in British Guiana, in succession to Mr. F. A. Stockdale, who left there to become Director of Agriculture in Mauritius.

* We never met anyone that was so in Barbados; the island is too densely populated and life too hard to allow of "slackers."

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

MAY, 1913.

The Budget and the Tropics.

A £195,000,000 BUDGET, BUT NOT A CENT FOR TROPICAL MEDICINE AND EDUCATION.

"A PROPOSAL deserving to be heartily supported is that of Professor Dunstan for the establishment of a tropical school of agriculture. The time is very proper for this step to be taken. Until within very recent years the Tropics exacted a heavy sacrifice from the able and promising young men who went out to them. Either they died at their posts or they came back broken in health and constitution. The schools of tropical medicine have gone far to achieve a complete victory over the adverse climatic conditions, so that operations can now be carried on where formerly they were impossible. Thus energetic and ambitious youths have a wider field open to them. At the same time there has been a great development in the growing of rubber plantations, which, with tea-planting, has become a very important form of tropical agriculture. These industries are both carried on in Ceylon, and in that island there is already a nucleus of what might become an Imperial college of tropical agriculture. Professor Dunstan suggests that Ceylon is, 'on the whole, the country best suited for the establishment of this college.' The idea would be for the student to undergo a course of training at one of the English agricultural colleges, and then follow it by one in tropical agriculture."*

* Sir Henry McCallum, ex-Governor of Ceylon, also strongly supported the claims of that Island in an able letter to the *Times* of May 12th. We feel, therefore, now that East and West have both had their cause fully and carefully laid before the Government and the public, it is for them to see which centre should have the first college, until, we hope, in the near future, each will have its college of agriculture.

Thus spoke *Country Life* of May 10th, and we fully endorse all they have said. At the same time we cannot help feeling how very little the Government of this country has done to improve matters, as described above, and to show its appreciation of the energy and enterprise, as well as of the set-backs and suffering which have been the lot of these pioneers when diving into the hinterland and unknown areas of the Tropics, in order to send us unstinted supplies of raw material and foodstuffs, to keep our factories busy, and to feed the great British public. And are the British public, or the Government elected by them, grateful? We fear not—neither grateful nor appreciative. In their ignorance or indifference as to where the supplies come from they take no precautions to safeguard the continuance of them; they do not even set aside a small fraction of what this country spends to carry on the work of the Schools of Tropical Medicine or to establish Colleges of Agriculture in the Tropics. What has been done to further the first of these two worthy and indispensable "Insurance" schemes has hitherto been done entirely by private effort and exertion. Mr. Lewis Harcourt says nice things about the idea of establishing tropical agricultural colleges, and Mr. Austen Chamberlain is doing magnificent work, as a private individual, by dragging in tens of thousands of pounds for the London School of Tropical Medicine, and we are sincerely grateful for the same. What we maintain, however, is that a leading man like Mr. Chamberlain should never have to be compelled to give up his time to go begging for that money which a really appreciative country should be only too ready to expend on those who sacrifice so much to feed the public and keep them in employment. If the Exchequer is driving us crazy or into prison to make us spend millions on national health insurance and national education; schemes which tap the lowest strata of this country, those who are a hindrance and no help; surely a fraction of the amount thus spent would be wisely expended on a tropical health insurance and a tropical educational insurance on similar lines for the benefit of planters, if only to safeguard and improve the workers overseas, as we are doing to the public here, so as to enable them to be of greater use to this country than they can ever be without this help. Although, undoubtedly, this ought to be done we do nothing; we do even worse than nothing—we put exceedingly heavy taxes on the produce shipped to us by our children overseas, to help educate, and insure, and downright pamper the working men and the lowest classes here, whilst the Government so far has done nothing for the tropical planter abroad—has done nothing, and does not seem ashamed of the omission.*

Tempora mutantur, nos et mutamur in illis (Times change, and we with the times). In the old days the prodigal son went abroad and rioted, and then came home and ate the fatted calf that had been carefully tended by the steadier folks at home. To-day it is the prodigal who stays at home, and wastes ours, not his substance, and it is the tropical planter who goes abroad to help make the fatted calf (now a golden one) for the prodigal at home to gloat over and glutton at, and to give nothing in return. "This year will

* See Indian Tea Association Notes, p. 86, column 2.

be, I anticipate, the most glowing year that British trade has ever known," Mr. Lloyd George, Chancellor of the Exchequer, and therefore Prodigal-in-chief (*pro tem.*), told the House of Commons on Budget night (April 22nd), and on the strength of that statement presents a bill of £195,000,000* for this country to pay,† in which not one farthing is to be voted to establish agricultural colleges in the Tropics or to further consolidate and assure the work of the London and Liverpool Schools of Tropical Medicine. What money these necessary institutions will get must come in the form of charity, *i.e.*, out of the pockets of everyone but the general public, who to-day cannot possibly exist without the Tropics, for as Europe and America develop their industrial enterprises agricultural pursuits must be, and will be, driven more and more elsewhere, *i.e.*, to the Tropics and sub-tropics. Had the Chancellor of the Exchequer voted (as he would do if he could realize what the Tropics means to this country) but £250,000 a year (that is about *one-eighth* of one per cent. only on the total amount demanded) for two or three years, then the foundations and assured success of the agricultural colleges and the work of the Schools of Tropical Medicine would be well and truly laid, and the future prosperity, happiness, and general welfare of the public "insured" far more certainly than the National Health Insurance, costing millions a year, with its panel doctors and sanatoriums, will ever bring about. We are too late, we fear, for this year, but we do hope, most sincerely, that our future prodigals will see to it (if only for selfish reasons, *i.e.*, if they want to continue to feast on fatted calves and to demand that they become bigger year by year) that the tropical planter is at least given the same medical and educational facilities that are offered and forced on the lower classes on this side, especially as the cost for the first will be but a fraction of that for the latter, and the benefits that will accrue from the latter cannot be compared in any way with the benefits offered by the Tropics.

WE have pleasure in announcing that we shall, before our June number appears, be welcoming Mr. Norman Rodger and the *International Sugar Journal* to London Town, as from the first week in June, their address will be (no longer Altrincham, near Manchester, but) 2, St. Dunstan's Hill, London, E.C. Will all readers of that leading paper therefore note the change of address and send all communications after June 9th to their London address as above.

* Long ago we warned our readers of the certainty of £200,000,000 Budgets, even in times of peace; see, for instance, p. 55 in our March (1910) issue, when we said: "This country must have more money for revenue purposes. This means that more of us must go abroad to extend the trade of the Empire. To-day we grumble at £150,000,000, in a few years we shall want £200,000,000. Let us therefore change our educational methods. Let us teach the children we can get control of to become agriculturists and colonizers."

† If the Tropics fell out of existence, how much of this amount could be raised? Of course, it must be remembered that the experienced and educated man who has invested his all in the Tropics has no vote. The working man, be he industrious or a waster, helpful or a hindrance, has a vote, hence, we suppose, he takes all for himself, and gives none to those who equally need and deserve it, if only because they send food and work for the voter who stays at home.

The Panama Canal and the West Indies.

A LITTLE ENCOURAGEMENT WILL MEAN A BIG BOOM.

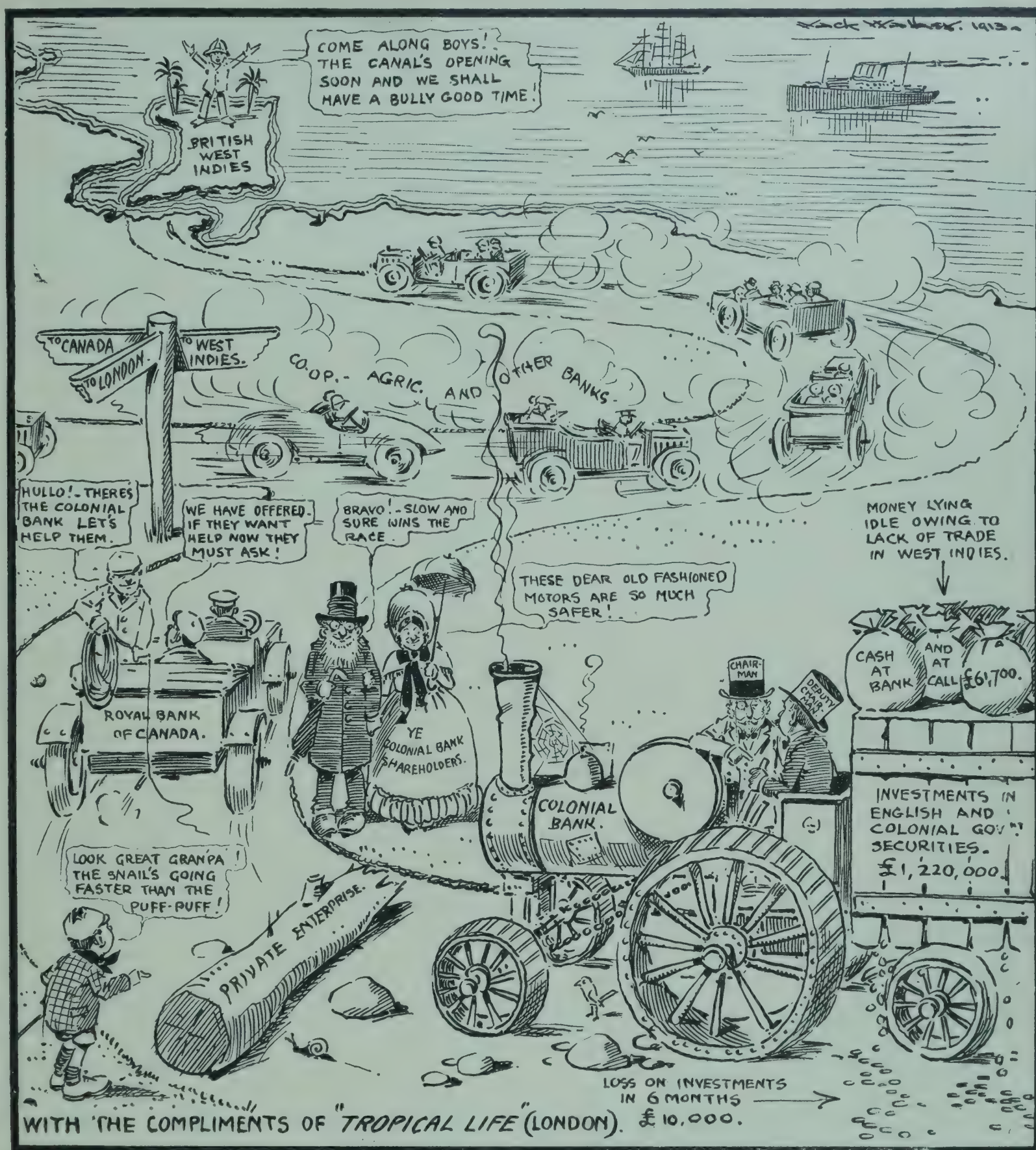
PRESIDING recently at the meeting of the Royal Mail Steam Packet Company, Sir Owen Philipps said working expenses in every business had been tending upwards, and shipping was no exception. The Company consumed considerably over half a million tons of coal per annum, and last year the increase in the price was 2s. 5½d. per ton. With regard to the West Indies, a drought in 1912 had caused a temporary setback, but the West Indies were more prosperous now than they had been for some years. The total trade of the West Indian Colonies, including Demerara, was over twenty millions sterling, compared with sixteen millions ten years ago.

Referring to the Panama Canal, the Chairman said it was difficult to say when the Canal would be opened, on account of certain landslides which had recently taken place. When it was opened, the Company would take steps to protect its interests, both in the North and South Pacific. This will no doubt be necessary, for, with the opening of the Canal, our West Indian possessions will come prominently to the front and their value as trade centres increase out of all proportion to their size. If their trade, as Sir Owen Philipps pointed out, has increased 25 per cent. (16 to 20) in ten years, we are certain this rate will be doubled and trebled once the canal is at work, "full steam ahead." Anyone doubting this has only to be actively engaged in one of the island stores favoured with orders when men-of-war are about, to realize what an active shipping connection means to the stores who find themselves in the midst of an important trade route. In such a one will the West Indian Islands be placed by the opening up of a direct route between the West and the East; between London, Hamburg, New York, &c., and Japan, and the ports of Australia, &c. The floating docks at St. Thomas and Trinidad will be busy at least.

Some eleven or twelve years ago the Hon. R. H. McCarthy,* then Collector of Customs at Port of Spain, Trinidad, after a trip down the Main, gave a carefully considered address on Trinidad as the Hong Kong of the East, and complained, if we remember rightly, of the way the authorities had always ignored the possibilities of the island as a transshipping centre, and allowed this promising trade aspect to be pushed out of sight like Cinderella was by her sisters. We agree with this opinion, but trust that the Panama Canal, like the Prince, will put Trinidad in her right place, so as to enable her to take that position which is hers by right in relation to Latin America† and which she would have if given a hustling trade commissioner to push her along. Even geniuses nowadays have to come out and advertise themselves; those, therefore, who want to make the most of our Western Empire, whether they be Government officials, shipping com-

* Mr. McCarthy is still an important authority on West Indian and Latin American shipping and railways, and is consulted by the English, Colombian, and other Governments, we believe, on such matters.

† Our Cartoonist is evidently of the same opinion. As the advance proofs of this cartoon have created a considerable demand for copies, we beg to inform readers that spare copies have been made, and will be sent (if on hand) on receipt of a penny stamp.



THE PANAMA CANAL AND THE COMING WEST INDIAN BOOM.

EXCITING MOTOR RACE BETWEEN BANKING ESTABLISHMENTS TO SECURE LEADING POSITIONS.

To the Editor of TROPICAL LIFE.

DEAR SIR,—Knowing that Mr. Jack Walker is making a “pot of money” over his cartoons and wants a safe investment, I sent him the report of last month’s meeting of the Colonial Bank, and recommended him to buy some shares. Whether he has done so or not, I cannot say; but he sent me the enclosed cartoon, and returned the report with his well-known pencil marks against the following:—

THE CHAIRMAN: The net profit is slightly less, and again we have to face that horrible fall in securities, which we seem never to get to the bottom of. We ask you this half-year to provide another £10,000 for depreciation of investments.

SHAREHOLDER No. 1: Why do we hold such an enormous amount of investments as compared with our money circulating in the islands? Is there not enough trade doing in the West Indies to enable you to use the money?

THE CHAIRMAN: Exactly so, that is quite the case.

SHAREHOLDER No. 2: I should like to ask whether the Court of Directors has done anything more with a view to amalgamating or working with a Canadian bank? &c., &c.

THE CHAIRMAN: I quite agree with you that a combination with a Canadian bank might be very advantageous. We had a proposal some years ago, as I daresay you know, but that went off through no fault of ours. Nobody else has approached us, but if any proposal is laid before us, you may be sure we shall give it the greatest consideration, and if it should be an offer which we feel justified in recommending to you, we should at once do so.

SHAREHOLDER No. 3: I should like to know if there is not a time shortly arriving when these large amounts for depreciation will cease, and whether they could not be perhaps carried out in a way different from what we are doing now, so that the amounts set aside will not be so large and the shareholders will have slightly better dividends than they have had for the past few years. It seems to me that for many years past we have been writing off these large amounts, and I should like to know if they are all quite necessary?

THE CHAIRMAN: I am afraid they are absolutely necessary.

Should you care to make use of these you are at liberty to do so.

Yours truly, A SHAREHOLDER.

panies, banks, or trade commissioner (an official still to be appointed), must, with the opening of the Canal, bestir themselves far more in the future to push on the interests of the West Indies than they have done in the past.* We trust they will do so.

The Use of Cableways Extending.

FURTHER REMARKS ON THE ARTICLES IN THE
Times of Ceylon.

PART II.

"THE aspect of aerial traction as applied to tea and rubber estates," and, we would add, cacao, coffee, and cotton estates as well, "is perhaps the most important," writes the correspondent to our Ceylon contemporary, "and the advantages gained by the employment of such means of transport are so far-reaching that it is almost impossible to reduce them to writing; they will probably only be appreciated in their full importance by the planter and visiting agent. It is a well-known fact in planting circles that no work is more heartily detested by coolie labourers than that connected with transport, and many superintendents, when transport is heavy and continuous, experience the greatest difficulty in maintaining an adequate labour force, and only do so at the cost of enormously enhanced advances. Short of railways, hand transport is, however, the only method that can take the place of cableways, whilst for cost, and as the cause of meagre labour supplies, hand-transport is far behind ropeways. It is further claimed that, apart from the saving in the actual numbers of labourers required for hand transport, and which are liberated and free to work under the trees where cableways are used, the moral effect on all will be such that coolies will much more readily agree to work on estates where cableways are used, and once there, seem much less inclined to move away from them."

The *Times of Ceylon* correspondent goes on to discuss the possibilities of joint or syndicate-owned lines, where the cableway can be run over more than one estate, and how the capital can be raised proportionately between the estate owners, and the rates chargeable to each. Such a line would then become a common carrier to all its members or owners, and claims for losses or damage could be made against it by any member. A case of joint cableway which, we are told, is believed to be working under most satisfactory arrangements may be cited at Cattarattenne, Rattota (Ceylon), where the Cattarattenne and Dangkande estates are jointly interested. Other similar arrangements are probably in existence, and those who, like ourselves, are in favour of giving such schemes a fair trial can no doubt hunt them out.

Coming, in conclusion, more to public cableways, these—as we believe was pointed out in the first issue of TROPICAL LIFE eight years ago—could be utilized in many producing centres in the Tropics as side lines or feeders to the main railway lines running to the chief

towns or shipping ports. Such feeders would greatly reduce the cost of transport, and save much anxiety and vexation to estates, which often have to send off the best men to cart the produce to the railway when they are most wanted to do work on the estate itself. Such lines, far from coming into competition with the railways, would increase their traffic.

These public lines could be practically of any length, though on the longer lines more than one power station would be required; but once the goods are there, and a regular daily tonnage can be relied on, there is no doubt the long lines, the same as the short ones, would pay. The three articles in the *Times of Ceylon* conclude by summing up the principal advantages to be looked for by adopting public cableways to transport goods in the Tropics:—

(1) Equal, or no great increase in cost of transport, or in districts exceptionally favourable to aerial transport, actually reduced cost.

(2) Absolute reliability of mechanical transport secured by duplicate system, as against total unreliability of cart transport due to disease among cattle or other causes.

(3) Speed of transport, loads moving at 3 miles an hour day and night, and despatch, being at an approximate rate of 3 tons per hour, or any greater amount required, in either direction, both directions working simultaneously.

Here, then, we have the advice of a most able authority who has carefully thought out the matter, and having done so, who so unhesitatingly recommends the establishment of aerial railways or cableways for transporting estate produce or estate supplies from place to place in the Tropics. We agree throughout with the suggestions made, and with the increasing difficulties arising on all sides through insufficient labour supplies, feel certain that many centres will be wise to utilize cableways either on the estates themselves, or to connect up the estates with the railways or waterways down to the shipping port.

We hope to continue these articles, in order to induce our West African, Latin American, and other friends, to be as keen to get cableways constructed to transport their rapidly increasing crops, the same as Ceylon is. As we said in January (p. 5), there are hundreds and thousands of miles of good lands that could be worked at a profit if some sort of transport was laid down, and judging from what our Ceylon friends have said, and our own experience with cableways, they seem to be the most economical and the easiest method of transport to adopt and work.

The Improvement of Indian Wheat.

THE January number of the *Agricultural Journal of India* (Pusa Institute) contains a very interesting article by Messrs. Albert and Gabrielle Howard on this question. As they truly remark, "any improvement in the production of this crop, either as regards yield or quality, would mean a large annual addition to the wealth of the country."

While the authors, however, then proceed to deal with two of the main essentials for the successful growing of wheat, viz., improved methods of cultivation and judicious seed selection, they do not touch on the all-important question of fertilization.

* We would here remind readers of our article in the December (1912) issue on the importance of increasing our trade with Latin America, and Mr. James Bryce's letter (see TROPICAL LIFE, February, 1913, p. 27), endorsing our views on the mistake of neglecting so important a market. Also see TROPICAL LIFE, December, 1911, "England's Chances in Latin America."

It is an established fact that, no matter how good the cultivation, or how judicious the selection of the seed, maximum crops cannot be grown, at all events continuously, without systematic fertilizing. Plants must be fed, and the requisite amount of the four main elements of plant food, nitrogen, phosphates, potash, and lime, must be supplied in one form or another. In nearly every country at the present time the quantity of farmyard manure available is totally insufficient for the requirements of the various crops, and even where there is a sufficient quantity it is more than likely that it does not contain enough actual plant food for the proper nourishment of the crop. Of course it is understood that, apart from its value as a fertilizer, animal manure supplies the very necessary humus to the soil, but the value of the actual plant food contained in it must almost always be a matter of uncertainty, so that even where it is available in considerable quantities, it is advisable to supplement it with some artificial plant food, of which there are so many varieties now to be had.

It is not our purpose to go into details as to the best method of supplying plant foods to various crops, as there are almost endless tables of results to be had for the asking of trials on every crop in every country in the world. We would, however, point to the *general* result of trials made by experts all over the world, and this is that the best yields are to be obtained by a judicious use of chemical manures together with a moderate amount of farm or stable manure. Where the latter is not available, chemical manures alone will give good results, provided that the humus of the soil is maintained either by the ploughing in of green crops or of any substantial vegetable matter which may be at disposal. This question of fertilizing is of the utmost importance, and it is to be feared that it is often sadly neglected by growers, either through ignorance or on the ground that they cannot afford the outlay.

In India, and especially in the wheat-growing centres alluded to by Messrs. Howard, it is evident that the authorities have been very active in their efforts to increase the yield and quality of the crop by thorough cultivation and judicious seed selection, with the result that they have more than doubled the yield in many districts. In the interests of India itself, and in fact of the world at large, it is to be hoped that they will take up the question of fertilizing, as there can be no doubt that the production can be further largely increased by this means.

According to Mr. W. S. Hamilton, I.C.S., of the Punjab Agricultural Department, a very fair demand for English ploughs, especially of the Meston type, is springing up. The merits of the Raja plough are generally admitted, but people hold back from buying partly on account of the cost (Rs. 27) and partly because they fear to overtax their bullocks. The chain harrow has not established itself as a satisfactory implement for eradicating weeds from among the young wheat; much depends on the character of the land and on the harrow being used exactly at the right time. For breaking the crust after rain or irrigation it is approved. It will be on trial for another year. Spring-toothed harrows are regarded as too heavy for the ordinary bullock, but the saving of time and labour in ploughing is recognized. Two steam threshers will tour in the Lyallpur district from April 20th. Wheat

will be threshed at 4 annas a maund up to May 31st, and at 2 annas a maund thereafter. The Canal department have agreed to charge no water rates on the Lower Jhelum Canal for indigo or *san* hemp grown for green manures. This concession has been in force on the Lower Chenab Canal for some time, but has not been taken advantage of. The reason is that it needs some self-control to use for a mere manure crop canal water which might be used for a remunerative crop of cotton. Cultivators are urged to sow *san* in their poorer wheat lands. (See also the *India Trade Journal*, April 17th, 1913, p. 97.)

It is rumoured that the Indian Government is taking steps to encourage the growth of some hundreds of thousands of acres of sugar cane—another of the necessities of life. If that be so, there will no doubt be a vast amount of preliminary work to be done in the way of irrigation, methods of cultivation, cane-selection, and so on, but it is to be hoped that the question of fertilization will not be neglected, since, judging by the yield of cane sugar on land already under cultivation, too little attention has been paid to fertilizing up to the present time.

CORRESPONDENTS in Queensland report that plantations on a commercial scale have been laid down in Northern Queensland; among other centres a plantation has been laid down on Cape York, and a wide margin of profit is looked for, especially as the climate and soil of North Queensland are in every way suitable for coco-nut estates. Local calculations estimate the world's annual output of nuts at 6,500,000,000, of which the by-products, whatever that may include, are valued at £50,000,000. Those owning estates in Queensland should, therefore, do well.

REFERRING to the letter of Mr. John T. Burns, Secretary of the International Dry-Farming Congress, published in our February issue, we have since heard that the coming congress, to be held from October 22 to November 1 next, promises to be one of the most interesting and valuable conventions yet held. The city of Tulsa is planning to spend \$200,000 or more on buildings and entertainments, and the exposition bids fair to be the largest agricultural exposition ever held. The U.S. Government have voted \$20,000 towards a federal exhibit, whilst Oklahoma itself will spend £10,000 on a mammoth Kaffir corn palace, to be made of rough timber and thatched from roof to floor with Oklahoma grown Kaffir corn. Delegates from all parts of the world, probably in excess of 10,000, are expected to attend. Meanwhile, we are told, notices and publicity matter are being sent to sixty nations.

THE Historical Medical Museum, organized by Mr. Henry S. Wellcome, which is to be opened in London towards the end of June next, will include some objects of exceptional historical medical interest. An important exhibit in the science section will be a large collection of the original apparatus used by the famous Galvani in making his first experiments in galvanism in the eighteenth century. Ancient microscopes and optical instruments, gathered from all quarters of Europe, will form another important feature, and a selection of surgical instruments used by famous surgeons when operating on historical personages is promised.

Cotton.

THE following were the prices for Cotton in London on May 8th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1912.		Good, 1911.		per lb.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	
Surat kinds*	5 $\frac{1}{16}$	to 5 $\frac{7}{8}$	5 $\frac{1}{16}$	to 6 $\frac{1}{8}$	6 $\frac{3}{16}$	to 6 $\frac{7}{16}$	—	5 $\frac{5}{8}$	to 5 $\frac{1}{16}$	7 $\frac{1}{8}$	to 7 $\frac{5}{16}$	—
Madras ...	6 $\frac{1}{16}$	to 6 $\frac{9}{16}$	5 $\frac{1}{16}$	to 5 $\frac{1}{16}$	—	—	—	5 $\frac{1}{4}$	to 6 $\frac{1}{16}$	6 $\frac{7}{8}$	to 7 $\frac{1}{2}$	—
Bengal ...	—	—	5 $\frac{7}{8}$	—	5 $\frac{1}{16}$	—	5 $\frac{1}{16}$	5 $\frac{1}{4}$	—	6 $\frac{7}{16}$	—	—
Assam ...	—	—	5 $\frac{5}{8}$	—	6	—	6 $\frac{1}{4}$	5 $\frac{5}{8}$	—	6 $\frac{5}{8}$	—	—
China ...	—	—	5 $\frac{7}{8}$	—	6 $\frac{1}{8}$	—	6 $\frac{3}{8}$	5 $\frac{7}{8}$	—	6 $\frac{1}{2}$	—	—
West Indian ...	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8 $\frac{1}{4}$	—	8 $\frac{1}{2}$	7 $\frac{3}{4}$	—	9	—	—
Sea Island ...	12 $\frac{1}{2}$	—	15	—	18 $\frac{1}{2}$	—	22	14	—	14	—	—
West African ...	5 $\frac{1}{16}$	—	6 $\frac{3}{8}$	—	6 $\frac{1}{2}$	—	—	6 $\frac{1}{2}$	—	8 $\frac{1}{8}$	—	—
East „ ...	6 $\frac{9}{16}$	—	7 $\frac{7}{16}$	—	9 $\frac{3}{16}$	—	—	7 $\frac{3}{8}$	—	8 $\frac{7}{8}$	—	—

* Liverpool quotations.

The market continues to move within very narrow limits, and closing prices are 4 $\frac{1}{2}$ to 2 $\frac{1}{2}$ points dearer for old and 3 $\frac{1}{2}$ for new crop deliveries. Purchases by the Trade are on an average as compared with the last few weeks. Weather reports from America are distinctly better. East Indian is easier and business dull.

The import into Liverpool this week (ending May 10th) amounts to 40,017 bales, since 1st September 4,033,083, same week last year 83,593, last year's total 4,623,090 bales. The estimated Sales amount to 49,000 bales, including "called." Middling American is quoted at 6.66d. per lb., last year 6.49d., 1911 8.35d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.
Brought into sight ...	12,935,000	15,064,000	11,237,000
Exports from United States since September 1st—			
To Great Britain ...	3,244,000	4,001,000	3,116,000
To Continent, &c. ...	4,067,000	5,237,000	3,627,000
Total crop ...	—	16,138,000	12,120,000

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	May 8th.	Same time 1912.	Same time 1911.
	d.	d.	d.
May ...	6.42 $\frac{1}{2}$	6.28	8.09
May—June ...	6.42	6.28	8.07
June—July ...	6.39 $\frac{1}{2}$	6.29 $\frac{1}{2}$	7.98 $\frac{1}{2}$

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

A QUIET tone has prevailed in this market, especially as the public market is now closed for the Whitsuntide holidays. There has been a rather better tone in the market for "futures," and values show some improvement for the week. We quote :—

	To-day	May 1st, 1913
London ... Santos, Sept. del. ...	51s. 6d.	51s. 1 $\frac{1}{2}$ d.
New York ... No. 7 Rio „ ...	11.34 cents	11.25 cents
Hamburg ... Santos „ ...	58 pf.	57 $\frac{1}{2}$ pf.
Havre ... Santos „ ...	70 $\frac{1}{2}$ francs	70 francs

The receipts at Rio and Santos from July 1st, 1912, to May 7th, 1913, were 10,731,000 bags, against 11,775,000 bags and 10,042,000 bags in the two previous seasons respectively.

The stocks in the principal ports of Europe on May 1st were estimated at: 1913, 6,813,000 bags; 1912, 6,658,000 bags; 1911, 7,633,000 bags.

The visible supply of coffee on May 1st was estimated at: 1913, 11,047,000 bags; 1912, 11,813,000 bags; 1911, 12,605,000 bags.

The Board of Trade returns for the United Kingdom from January 1st to April 30th are as follows :—

	1913	1912	1911
	cwts.	cwts.	cwts.
Imported ...	404,509	354,049	369,179
Home Consumption ...	87,363	95,515	83,417
Exported ...	126,335	166,063	152,734
Stock, April 30th ...	353,000	308,000	575,000

Sales include the following, viz. :—

East India.—650 bags, viz., Mysore, 68s. to 72s. for smalls, 74s. 6d. to 78s. for middling to good middling, 77s. 6d. to 83s. 6d. for bold. Naidoobatum, 72s. for smalls, 78s. for medium, 81s. 6d. to 85s. for bold to extra bold.

Uganda.—21 bags, at 72s. 6d. for middling, 76s. for bold.

Nairobi.—47 bags, at 75s. for smalls, 80s. for good middling, 84s. 6d. for good bold.

Costa Rica.—1,850 bags, at 71s. to 74s. for smalls, 66s. 6d. to 80s. 6d. for ordinary to good middling, 79s. to 88s. 6d. for middling to fine bold.

Guatemala.—440 bags, at 62s. 6d. to 65s. for smalls, 70s. to 74s. for fine fine ordinary to middling, 73s. 6d. to 80s. for bold, 100s. for Maragogipe.

Salvador.—320 bags, at 64s. 6d. for ordinary brownish, 67s. 6d. to 68s. for foxy green peaberry, 99s. for Maragogipe.

Nicaragua.—187 bags, at 72s. to 73s. for middling.

Vera Paz.—130 bags, at 68s. 6d. to 75s. for smalls, 80s. to 84s. 6d. for bold.

Mexican.—231 bags, at 74s. 6d. for good middling.

Colombian, &c.—480 bags, at 52s. 6d. to 69s. 6d. for smalls, 69s. to 74s. 6d. for good ordinary to good middling, 71s. 6d. to 76s. for bold.

Dumont Santos.—1,790 bags, unwashed at 62s. to 67s. for bold.

Sugar.

MR. C. CZARNIKOW, writing on May 8th, tells us that continued May realizations, combined with accumulations of sugar in Cuba and favourable weather on the Continent, were the cause of a decline from 9s. 9½d. to 9s. 5½d. for May Beet, next crop dropping at the same time from 10s. 1d. to 9s. 9½d., whilst the quotation for August brought that month ¾d. below October/December. Germany and Bohemia report beneficial rains, and nothing more is now heard of the drought, but at the present level of prices we must always be prepared for criticisms of the weather, which would affect us less if prices included more margin for unfavourable yields and weights. In a few weeks we shall have exact figures of the area sown, and be able to make average calculations of future supplies.

For the present season it seems that supplies will be quite as liberal as expected. Cuba some ten days ago had cooler weather with hailstorms, and the weather seemed more settled lately, so that production may be fully up to and even slightly above expectations. With fair weather it seems safe now to expect 2,300,000 tons. American consumers are probably running their stocks too low, and before a settlement of the duty question, a revival in demand may necessitate large purchases. It is therefore reasonable to surmise that if an improvement is due anywhere, it is in the United States; anyhow, Cuban supplies to Europe will be larger than expected. On the other hand, in the East the Java prices remain, so far, out of reach for us altogether, and though for months the world has been wondering and predicting Western exports of 200/300,000 tons out of a crop of 1½ millions expected in Java, we are not much nearer August/September arrivals in Europe or the United States. Whether we shall get much in October/December remains questionable.

The American market has been quiet, and Cuban Centrifugals for second half May shipment sold at 2 cents c. and f. The spot quotation is 3.36 cents = 9s. 3d. c.i.f. New York, or 9s. 9d. c.i.f. United Kingdom. As regards refining grades of Cane Sugar in the United Kingdom, further business has been done in Cuban Centrifugals at easier rates. Grocery Crystallized at Friday's auction sold freely at steady to slightly easier rates, but on Tuesday buyers were not ready to take further quantities, and very little was sold. Low brown sugars are in some cases 3d. per cwt. cheaper.

As regards Cane-producing countries, the Australian mail confirms that the hurricane reported in Fiji some time ago did considerable damage, but the weather continues favourable for the growth of the crop.

The total transactions of British West India for the week amounted to about 12,000 bags, and included Crystallized Demerara, middling greyish yellow at 14s. 9d. to 15s. duty paid, middling yellow, 15s. to 15s. 3d.; fine yellow and pale, 16s. 9d. to 17s. Crystallized Trinidad, middling yellow and greyish ditto, 15s. 3d.; good yellow and palish, 15s. 9d. to 16s.; fine yellow and pale, 16s. 9d. to 17s. 3d.; Syrups, bright strong brown, 11s. Crystallized Jamaica, low greyish brown, 13s. 9d.; middling yellow, 15s.; deep bright yellow, 15s. 9d. Muscovado, middling soft

grey, 15s. 3d. St. Lucia Syrups, low strong grey, 10s.; bright brown, 10s. 9d. to 11s.; low heavy yellowish, 11s.; middling yellow, 12s.

Brown Mauritius Syrups to arrive sold at 8s. 3d. ex ship London; and at auction, yellow Crystallized were bought in at 17s., whilst Guatemala Syrups sold, bright brown at 11s., good brownish, 11s. 6d.; middling soft grey, 14s.; good pale, 14s. 9d.

100 bags, St. Croix Crystallized sold, low grey, 13s. 9d. to 14s.; low greyish brown, 14s. 3d. duty paid.

At the request of the Director of Kew Gardens Messrs. Boving and Co., Ltd., have just forwarded him a model of the Samson Stump Extractor, so that the many planters, and those interested in estates, and land clearance in the Tropics, &c., when visiting the Gardens, may have the opportunity of inspecting the implement, and of ascertaining its powers and advantages. We have no doubt but that it will attract much attention. Full illustrated particulars of these machines were included in our book "Coco-nuts—the Consols of the East," pp. 469-473, or can be had, brought up to date, on application to Messrs. Boving and Co., Ltd., 9½, Union Court, Old Broad Street, London, E.C.

Coco-nut Products, &c.

COCO-NUT oil has been a laggard; like Shakespeare's schoolboy it creeps along unwillingly to the factory. It had already, according to Messrs. Mordaunt Bros., lost its energy by the middle of April, and April 26th found it 10s. a ton lower at 45s. and Cochin 42s. 9d., May-June delivery. May brought no change—at least, not in the shape of increased energy. It was still an idle market at the beginning of May, with prices tending lower, and 15s. to 20s. a ton below April 26th, making a 25s. to 30s. a ton drop in all. Since then the latest quotations show a slight improvement, say, Ceylon spot, 45s.; April-May, c.i.f. £43 5s. Cochin spot, £51; May-June, c.i.f. £45. Owing to the Whitsun holidays, no report was issued for Saturday, May 10th, so we must omit the usual table.

According to the *Public Ledger* of May 10th, prices ruled as under (per ton):—

Soya Oil Beans.—Parcels Harbin spot sold at £8 3s. 9d.; afloat £8 6s. 3d.; May-June and July-August, £8 8s. 9d. Hull.

Linseed Cake.—London-made is worth £7 12s. 6d. to £7 15s.

Cotton Cake.—London-made, £5 17s. 6d. to £6.

Copra remains steady. Manila, March-May, £27 10s. sellers; April-June, £27, and July-September, £26 10s. Cebu, April-May, £28 5s. sellers. Java, February-April, £28 17s. 6d. sellers, and April-June, £27 17s. 6d. done Northern Ports net. South Sea Islands, April-May, £27 12s. 6d. sellers Continent; April-May, £27 12s. 6d. sellers London. Malabar, April-May, £30. Ceylon, April-May, £29 12s. 6d. sellers Northern Ports. F.M.S. Straits, May-June, £28 buyers Northern Ports. F.M. May-June, £27 15s. sellers. Mixed, no Padang, April-June, £26 17s. 6d. sellers. Macassar, May-June, £27 15s. sellers c.f. and i., delivered weight.

Soya Oil.—Hull: Naked extracted spot and forward, £24 15s. Oriental (in cases), February-March, £23 17s. 6d. c.i.f.; March-April, £23 10s. c.i.f.; April-May, £23 10s. c.i.f. Antwerp; May-June, £23 15s. c.i.f. Antwerp. Liverpool makes, in export barrels, move off very quietly, but the quotation remains unchanged at 30s. per cwt.

Coco-nut Oil.—Ceylon spot, £45; April-May, £43 5s. c.i.f.; May-June, £42 10s. c.i.f. Cochin spot, £51; May-June, £45 c.i.f.

Palm Oil.—Lagos on spot, £34. Up at Liverpool, forward deliveries continue to attract buyers, and a fair trade has again been concluded, but values generally are the turn easier. Sales 1,300 tons, including spot Saltpond, £25 2s. 6d., and Lagos £30 to £30 7s. 6d., with arrival Hards, May-June, £27 5s. to £27 2s. 6d., and June-July, £27 2s. 6d. to £27 10s. Benin, May-June, £28 15s.; softs, May-June, £29 5s. Emoe, May-June, £29 5s., and Lagos, May, £30 5s. per ton, all transit.

Palm Kernel Oil.—May, £41 10s.; June, £40 15s.; July-December, £40 f.o.b. Hamburg.

Messrs. Goodlake and Nutter, reporting on Coco-nut Oil, say that Ceylon Oil keeps quite steady, and there is a little more inquiry, though America does not appear as a buyer to any extent just now. We quote March-April London, 43s. 9d.; April-May, 43s. 3d.; May-June, 42s. 6d. Cochin Oil inactive; 45s. 6d. April-May; 45s. 3d. May-June. Palm Kernel Oil: There is more inquiry for near positions, and we quote 41s. 6d. May; 41s. June; July-December buyers about 39s. 6d. and sellers at 40s. to 40s. 3d. f.o.b. Hamburg. Pressed Oil is a little inquired for. We quote 41s. May; 40s. 9d. June f.a.s. London in Ceylon casks. Spot prices are: Cochin, £47 to £51; Ceylon, £44 to £47.

According to the *Samoanische Zeitung*, the following were the bids for the 1913 copra crop in American (not Upolu, i.e., German) Samoa. The crop is estimated at 1,500 tons, and Judge Dwyer, who, we believe, received the bids, says that of the El Dorado Oil Works was accepted. The tenders, per ton of 2,240 lb., were as follows: John Rothschild and Co., San Francisco, \$81.00; Pacific Oil and Lead Works, San Francisco, \$94.00; Burns, Philp and Co., Sydney, \$95.25; El Dorado Oil Works, San Francisco, \$100.25.

The India-rubber Market.

Up at Liverpool the Pará market was dull but firm during the week (ending May 10th), and only a retail business has taken place, owing to the disinclination of sellers to operate at present prices. About 60 tons sold, including hard fine May-June, 3s. 5½d. to 3s. 7d., June-July, 3s. 6d. to 3s. 7d.; August-September, 3s. 6d. to 3s. 7d.; and September-October and October-November, 3s. 6d.; also Cameta for May at 1s. 11d. per lb. There is still very little inquiry for medium Brazilian grades, and only small transactions have occurred. The African market has been steady, and the sales reported amount to 45 tons, including red Assinee niggers, 3s. to 3s. 1d.; selected Gold and/or Ivory Coast lump, 1s. 6d.; ditto rejections, 1s. 5½d. to 1s. 5½d.; ditto pasty rejections, 1s. 4½d. to 1s. 4½d.; Niger paste, 10d. to 10½d.; Accra paste, 10½d.

to 11d.; Rio Nunez niggers, 2s. 11d.; Conakry sheets and strings, 2s. 10d.; blue Niger cake, 1s. 8d., and Niger flake, 10d. per lb.

In London, Messrs. S. Figgis and Son report that at the auctions at the beginning of May 908 tons Eastern Plantation rubber were offered against 1,078 tons a fortnight since.

Privately the market had been depressed and lower, with a good deal of "bear" selling, and pale Crêpe went as low as 3s. 2d.; hard Pará, 3s. 4d., but at the sales the competition was good, and prices went above the opening rates of a fortnight ago and a penny per lb. over recent low sales, closing firmer. Prices closed as follows: Pale Crêpe now 3s. 3d.; hard fine Pará, 3s. 5d.; Caucho ball, 2s. 5d.; Lewa ball (Manihot), 2s. 1½d.; dark rough pats, 2s. 3d.

On account of the Whitsun holidays sales were held on May 6th and 7th again, instead of a week later, when privately the market was firm. f.a.q., Crêpe now 3s. 2½d.; hard fine Pará, 3s. 6½d.; and Caucho Ball, 2s. 5½d. On this occasion 484 tons were offered, and sold with competition at about a halfpenny decline on the average of last sales for good Crêpe and Sheets, but brown and dark Crêpes were steady, say:—

Plantation Malaya.—Crêpe, fair to fine pale, dull to good palish, 3s. 1¾d. to 3s. 2½d.; light brown and grey, part streaky, 3s. 0½d. to 3s. 2d.; fair to good clean brown, 2s. 10¾d. to 3s. 1¾d.; dark and specky brown, 2s. 7¾d. to 2s. 11¾d.; dark and black, part pressed, 2s. 5¾d. to 2s. 10¾d.; dark and black, inferior, 1s. 9¾d. to 2s. 5d.; dark to good smoked, 2s. 9½d. to 3s. 1½d. Sheets, fair to very fine smoked (Highlands 3s. 4d. to 3s. 5½d.), 3s. 2d. to 3s. 3¾d.; damp, mouldy, and part smoked, 3s. 1d. to 3s. 2d.; fair to fine unsmoked, 3s. 2d. to 3s. 2¾d.; damp, mouldy, and stuck, 2s. 10¾d. to 3s. 2d. Block, fine pale Lanadron, 3s. 2¾d. Scrap and Virgin, fair to good, 2s. 4d. to 2s. 6½d.; mixed and inferior, 1s. 8d. to 2s. 3d. Rambong, Crêpe, nothing offered; scrap and block, 2s. 5½d. Castilloa, sheet, 2s. 3d.

Ceylon.—Crêpe, thick dull to fine, 3s. 2d. to 3s. 2¾d.; fair to fine pale, dull to good palish (1 lot 3s. 2¾d.), 3s. 1¾d. to 3s. 2½d.; light brown and grey, part streaky, 3s. 0¾d. to 3s. 2d.; fair to good clean brown, 2s. 10½d. to 3s. 1½d.; dark and specky brown, 2s. 7¾d. to 2s. 11½d.; dark and black, part pressed, 2s. 5¾d. to 2s. 10¾d.; dark to good smoked, nothing offered. Sheets, fair to good smoked, 3s. 2d. to 3s. 2¾d. Sheets and Biscuits, fair to good unsmoked, 3s. 2d. to 3s. 2½d.; damp, mouldy, and stuck, 3s. 0¼d. to 3s. 1½d. Scrap and Cuttings, fair to fine, 2s. 4d. to 2s. 6¾d.; mixed and inferior, 1s. 0¾d. to 2s. 3d.

Manihot.—Thick brown Crêpe, 2s. 9d. to 2s. 11¼d.

Soudan.—Pressed sheets, 2s. 9½d. to 2s. 11½d.; scrap and pieces, 2s. 1¾d. to 2s. 5d.

Central American.—White Virgin biscuits, 2s. 5½d.; porous wet slab, 1s. 8d.

Mozambique.—Pressed reddish Crêpe, 2s. 5¾d.; reddish ball, 2s. 8½d.; white ball, 2s. 5½d.

Congo.—Black thimbles, a little heated, 2s. 7½d.

According to Messrs. Hale and Son, East African Manihot continues to meet a good demand. A shipment of nice quality Soudan sheet sold under active competition, and Mozambique ball has been in better request, and fair sales were made as under:—

East African Plantation.—Manihot, free brown

Crêpe, 2s. 11d.; Manihot free brown mouldy, 2s. 9d. to 2s. 10d.

Soudan.—Pressed palish sheet, 2s. 9½d. to 2s. 11¼d.; pressed scrap, 2s. 1¼d.

Mozambique.—Fair red and white ball, 2s. 8½d.; partly heated white ball, 2s. 3d. to 2s. 5½d.; pressed red Crêped root rubber, 2s. 5¼d.

Uganda.—Slab, 2s. 1d.

Pará statistics for the month of April (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará ...	2,110	1,430	= 3,540	agst 3,270	3,490	3,600
Shipments to Europe	1,370	1,020	= 2,390	„ 1,730	1,720	3,660
„ „ America	770	350	= 1,120	„ 1,350	1,110	470

Crop statistics, June 30th, 1912, to April 30th, 1913 (10 months):—

	Pará.	Caucho.	1912-13.	1911-12.	1910-11.	1909-10.	1908-9.
Pará { 1912-13	29,210	7,760	36,970	33,380	32,720	35,780	34,180
Receipts { 1911-12	28,020	5,360					
„ Shipts. Europe	15,380	5,630					
„ „ America	14,650	2,460	17,110	17,500	11,640	15,770	16,970

The London Cocoa Market.

By THE EDITOR.

BUYERS are complaining that the prices of West African are far too high, and ask why, with a reported output to the end of March of 4,050 tons, against 2,266 tons last year, and 3,312 tons in 1911, prices do not ease down; certainly such an increase might seem to warrant it, especially as the joint London and Havre stocks (of all growths) showed an increase at the end of April of 86,000 bags, compared with the end of December, say, 293,000 bags at end of April, against 207,000 bags at the end of December.

Advantageous as I believe lower prices would be to manufacturers, I am not surprised that values continue to maintain a higher parity than last year, when London and Havre together had 338,000 bags, or 45,000 more than they show now, and all the outputs (except the Gold Coast) showed in the aggregate much larger outputs than we have so far obtained during this crop. The Guayaquil receipts are actually less than half those of last year—169,500 qtls., against 357,500 last year—and Trinidad and Grenada together have, so far, only exported 174,000 bags against 215,500 bags during the same period in the 1911-1912 crop. Perhaps, also, an important contributory reason of present high prices is the fall in the Lisbon stocks; at this centre the deliveries during the single month of April actually exceeded the stocks left behind at the end of that month. Here are the figures, supplied by Messrs. Martin Weinstein and Co.:—

	Bags.
Lisbon stock, March 31st ...	57,600
Landed in April ...	12,725
Total ...	70,325
Delivered in April ...	36,595
Leaves stock on April 30th, 1913...	33,730
Against „ „ 1912...	110,491
„ „ December 31st, 1912..	92,000

Meanwhile Havre quoted San Thomé at fcs. 86 to 88 on April 30th, against fcs. 68 to 70 last year, and

London 66s. to 68s., against 53s. to 56s. Up at Liverpool, African kinds on May 10th were quoted at 54s. to 68s., *versus* 42s. to 54s. in 1912.

Most of our readers are probably aware that I am deeply absorbed in trying to get out the book dealing with the “Fermentation of Cacao,” including reports and discussions on the fermentation and oxidation of other crops (coffee, tobacco, tea, &c.) for comparison. As the book will mainly consist of seven essays contributed by as many leading authorities on the subject, the book, when complete, will be an interesting and important one, and although highly controversial (for the authorities do not agree on all points) yet for this very reason the details are thoroughly discussed, since each authority has kindly contributed “a last word” on the subject so as to bring the whole up to date. Every endeavour will be made to have the book ready by August. Had it not been for the technical translations it would have been ready this month. Among those who have done so, I am pleased to report, is Dr. Fickendey, who has charge of the Agricultural Department at the Cameroons. With his “last word,” this gentleman was good enough to send the following particulars of the Cameroon output, and as the figures are not generally known I will include them in full here.

Export of cacao from the Cameroons (January to December) (tons of 1,000 kilos):—

1900 ...	260	1906 ...	1,252
1901 ...	528	1907 ...	1,797
1902 ...	648	1908 ...	2,447
1903 ...	913	1909 ...	3,323
1904 ...	1,143	1910 ...	3,431
1905 ...	1,413	1911 ...	3,582
1912 ...	4,600 (about).		

Coming now to the matter of stocks, these work out as follows:—

London Stock, May 10th—	1913. Bags.	1912. Bags.
Trinidads ...	7,828	7,935
Grenadas ...	8,128	7,936
Other W.I. ...	3,369	7,886
British Africa ...	10,489	11,680
Portuguese Africa...	7,494	4,532
German Africa ...	5,417	5,859
Ceylon and Java ...	24,207	17,431
Guayaquil ...	12,203	43,278
Brazil and Bahia ...	497	2,470
Other Foreign ...	7,630	7,009
Totals ...	87,262	116,016
Saturday, May 17th	85,141	116,544

Havre Stock, April 30th—	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
Pará ...	15,932	83 to 88	8,741	74 to 77
Bahia ...	14,532	82 „ 86	15,686	66 „ 72
Venezuela ...	35,351	85 „ 185	46,247	73 „ 200
Trinidad ...	21,461	86 „ 90	37,298	73 „ 77
Grenada and O.W.I.	4,307	78 „ 87	6,172	65 „ 72
San Thomé ...	9,380	86 „ 88	7,004	68 „ 70
San Domingo ...	5,915	74 „ 78	8,105	61 „ 65
Haiti ...	7,136	69 „ 82	12,586	53 „ 66
Accra ...	62,043	76 „ 80	55,551	62 „ 65
Guayaquil ...	20,271	88 „ 95	14,850	66 „ 75
Others ...	9,538	—	7,783	—
Totals ...	205,866 bags		220,023 bags	

Coming now to the matter of consumption, the Board of Trade figures for the United Kingdom for the month of April are again disappointing, being 564

bags behind last year. As regards the deliveries for home consumption (1,985 tons, against 2,549 last year, and 1,133 tons in 1911), this has pulled down the four months' increase to only 288 tons, say:—

Raw Cocoa only—	Landed.	Del'd H.C.	Exported.	Stock (April 30th)
Jan.-Apr. 1911—	15,739	6,500	448	16,930 tons
" " 1912—	14,973	9,177	745	13,228 "
" " 1913—	15,109	9,465	695	12,227 "

Incr. 136 Incr. 288 Decr. 50 Decr. 1,001 "

Foreign manufactured, on the other hand, showed a most noticeable jump up, 995 tons delivered in April only, for home consumption, against 668 tons last year, and 506 tons in 1911, or an increase of 50 per cent., against a decrease of 564 tons (for April) in the deliveries of raw cocoa. The alteration made some little time back in the import duty on cocoa coming into this country has certainly encouraged the importation of the foreign article.

May 13th being Whit Tuesday, no auctions were held on that day, but business done previously to that date showed values to have been:—

Trinidads lately have not been selling. In April, however, some 700 bags changed hands at prices that were considered to show a drop of 1s., say 75s. to 78s. for fine to superior, and 72s. 6d. to 74s. for good mid. red. Lately good mid. to fine sold at 74s. to 77s.

Grenadas, instead of going down, tend upwards; good to fine last sold at 67s. to 69s.; common unfermented to fair fermented, 64s. to 67s.

St. Lucia.—Good to fine marks sold 67s. to 69s.; common to fair, 63s. to 66s. 6d.

Dominicas.—Some fine realized 67s., whilst ordinary unfermented to fair fermented sold at 61s. 6d. to 63s.

Jamaica.—I believe a fine mark is, or was, being held for over 70s., whilst good red realized 67s., and fair 65s.

Costa Ricas also sold well; fair reddish 63s. and 64s., extra bold 81s.

Honduras.—Good red realized 66s.

Colombian.—Fine bold sold at 103s. 6d. to 104s.

Panama.—Fine bold realized 103s. 6d. to 104s.

Puerto Cabello.—Good bold fetched 97s. 6d., rather finer 102s. 6d.

Samoa.—Good to fine 75s. to 81s.

British West Africa.—Fair reddish sold at 63s.; good fermented, 67s. Up at Liverpool, 1,000 bags, Accra kinds, sold at 60s. to 62s. 9d.

Cameroons.—A nice lot of good red sold at 68s.

Bahias are valued at 67s. 6d. to 72s. for fair to superior, against 66s. to 68s. for San Thomé.

Java.—Fine sold for 84s.

Guayaquil, although in such small supply, sells slowly; in fact, so far as London's spot business is concerned we hear of very little doing. Arriba is valued (nominally) at 75s. to 78s.; Machala and Caraquez, 71s. to 74s. or 75s. Business in the latter (Caraquez) has been done at 71s. to 75s.

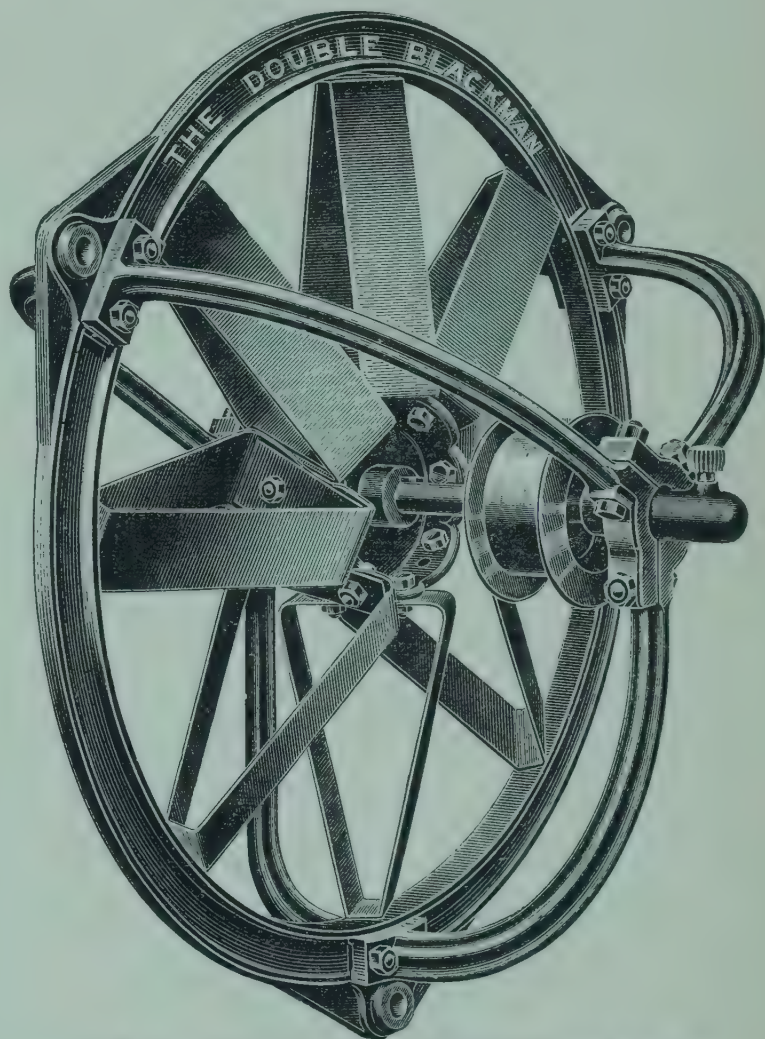
Ceylon.—Fine bold tends upward and last sold at 89s. 6d.; good to fine, 73s. to 86s. 6d.; ordinary to good red and boldish, 56s. to 73s. Fine "Native" realized 73s., and fair down to 50s.

At the sales held on May 20th, after the Whitsun holidays, prices went higher, fine Grenadas, for instance, realized 68s. to 70s.

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Our Book on "The Fermentation of Cacao."

THE above book is nearing completion, the matter is in book form, and as soon as this, the final proof, is passed, and the index drawn up, the book will be ready for publication. The various essays have made up a substantial volume between them, many illustrations being included. The price will be the same as that of our two previous works, *i.e.*, 10s. net, or 11s. post free. Essays by the following authorities have been included:—

(1) Dr. Axel Preyer, Berlin; first published 1901.

(2) Dr. Oscar Loew, Munich, formerly of Tokyo and Porto Rico. With some comparative notes on the fermentation of tea and coffee; first published in 1907.

(3) Dr. Fickendey, Cameroons, German West Africa; first published in 1909.

(4) Dr. Schulte im Hofe, Berlin. With some comparative notes on the fermentation of indigo, tea, coffee, and tobacco.

(5) Dr. J. Sack, Holland and Surinam.

The Joint Essay that won the £50 prize offered by TROPICAL LIFE, and written by:—

(6) Mr. Geo. S. Hudson, St. Lucia, B.W.I.

(7) Dr. Lucius Nicholls, of Cambridge and (at the time) St. Lucia, B.W.I.

(8) "The Last Word." Being notes written this year, by the various authors, so as to bring their views up to date.

(9) Some comparative notes on tobacco fermentation by the Editor, Mr. Harold Hamel Smith, who also contributes in the Introduction some notes on the necessity of standardizing exports, on the possibility of making vinegar from the cacao-juice for human consumption, or denatured alcohol for motive power, &c., and on the need of the various Governments assisting planters to choose the best machinery, &c., by testing them first, and so enabling both the makers who sell the machines, and the planters who buy them, to see exactly how far they are able to do in the Tropics all that is claimed for them at home in the factory. There is no doubt that the book when complete will supply a long-felt want, and fill up an, at present, wide gap that hitherto tended to prevent further investigations in the subject.

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Agricultural Colleges in the Tropics.

MEETINGS HELD IN LONDON.

WE believe that before our next issue appears representative men from Ceylon will have met those from the West Indies and held a friendly and informal discussion as to the relative claims and needs of each centre for an Agricultural College to be set up in their

midst. We trust that when the meeting does take place such men as Sir Henry McCallum, Sir Henry Blake, Sir E. Rosling, Mr. Crosbie Roles, Mr. Hutchison (of the *Times of Ceylon*), Professor Wyndham Dunstan, and others will be present to advance the case for Ceylon, and Dr. Francis Watts, Sir Daniel Morris, Mr. Norman Lamont, Mr. Cathcart Wason, M.P., Colonel Arnold, Mr. John McConnell, and other leading authorities to argue the claims of Trinidad and the West Indies.

Sir Robert Perks has kindly placed his house, in Kensington Palace Gardens, at the disposal of the Committee of the Liberal Colonial Club, who are organizing the meeting, at which a goodly muster of Members of Parliament will be present, whilst the meeting will be in every way non-political, and quite unofficial and informal, many, if not most of those whom it is hoped will speak, being Conservatives. Meanwhile the Ceylon Association in London held an important meeting on June 12th, at which Sir Henry McCallum, ex-Governor of the island, urged the claims of Peradeniya as the best site for the first college, and those who took part in that debate will now have the chance of meeting the West Indian representatives, as well as those interested in Malaya, tropical Australia, &c., on neutral ground, to discuss and thresh out the matter thoroughly. With a little luck, therefore, those of us—and our numbers by now are considerable—who wish to bring the matter directly before leading parliamentarians will have a chance to do so, and this being so, it is to be hoped that good use will be made of so favourable an opportunity.

Besides the above meetings, the West India Committee, which holds periodical meetings to discuss matters of leading interest and importance, and is in the position to put forward a strong and influentially supported case, is certain to have a gathering of the clans to hear the views of their leading men on the subject, and to press forward the need of developing the utility of the subject to this country, as has already been done with the products, by establishing organized channels whereby young men here and in the self-governing colonies (as well as their fathers who have to start them in life) can see their way straight and clear to adopt the profession of agriculture abroad in the same way as is done with regard to medicine, law, engineering, &c., on this side. Educate the boys well on this side, and then have agricultural colleges in the Tropics where they can specialize for one, two, or three years.

By some such means alone will the supplies of food-stuffs and raw material necessary for this country be assured, and although the Colonial Office seems loth to acknowledge the full importance of the West Indies as a training centre for the Latin American trade with such men as one sees at these meetings of the West India Committee, including Sir Owen Philipps, Sir Daniel Morris, Mr. Norman Lamont, Mr. Mitchell-Thomson, M.P., Mr. Ian Malcolm, M.P., Rt. Hon. Parker Smith, Mr. Sandbach Parker, &c., any matter discussed by them must undoubtedly receive a considerable impetus when brought personally before the notice of the Colonial Secretary.

Indian Crops and Manuring.

WE are glad to note from the *Morning Post* of India, April 18th, that our article on the fertilization of tropical crops has aroused interest.

The excellent leader in the above-mentioned issue further confirms our views on this all-important subject.

We fully understand that the Government of India is doing good work for the cause of agriculture generally in the Indian Empire, and we realize the many difficulties to be overcome in dealing with a very conservative native population.

But these difficulties are not, or should not be, insuperable. As we stated in our March issue, an object lesson has been provided in the case of Egypt, where the native cultivator is often in no better financial circumstances than is the case in India, and is every bit as conservative.

This is what our Editor urged in his letter to the *Times*, supporting the demand for agricultural colleges in the Tropics, when he said:—

“If you wish to raise a people, especially agriculturists in the Tropics, by improving its methods of cultivation and commerce, you must work downwards from a class where the conversion can be made thorough and assured, and that success will not be attained by toiling upwards through innumerable thousands of ignorant and prejudiced natives, who are averse to change of any description unless they have actual proofs before them that the proposed changes are to their advantage.

“I have always been anxious to see well-educated young men fresh from our public schools, or one of the universities (not forgetting those on the other side of the Tweed), go to the Tropics as planters, managers of estates, &c., for two reasons. First, such men would take money of their own to invest in tropical undertakings, or, if properly trained for the work, they would inspire confidence in others who have the capital necessary, to invest it in planting enterprises; secondly, the presence of such a class would, as has been lately proved in the case of the plantation rubber industry, assure the economic development of our tropical dependencies, hitherto badly neglected, and, above all, send home valuable supplies of foodstuffs and raw materials for our consumption over here. I believe such a system, beginning comparatively high up in the social scale and among capitalists, would benefit the small proprietors and labourers in the Tropics far more than any system of education, as Mr. Sampson seems to suggest, for it must be remembered all our tropical colonies have excellent agricultural departments, and many of them quite a network of conveniences for getting at the lowliest of agriculturists and showing him how to grow two yams where he only grew one, and that perhaps a diseased one, before; if they want to be taught, that is, but some are too suspicious to come out of their shell to learn.

“This very characteristic is, however, only a further proof of beginning at the other end of the stick. Acting on the idea that example is better than precept, let us establish agricultural colleges in the Tropics to train men who have already been well educated generally (whether in the United Kingdom or elsewhere in the Empire it does not matter), and show them how to

get the largest and most remunerative crops out of the ground; and what will be the result? I think you will notice that every native, as soon as he sees with his own eyes, and not through those of an instructor, the benefits accruing from the improved methods of cultivation adopted by the ex-college student (methods probably carried out by the native himself as a labourer on the European's estate), will go home and do likewise, and so learn for himself and by his example spread the benefits to others, what the college has taught the original student to do; and whilst the student pays to learn, the native learns for nothing—he is, in fact, paid to do so, since he receives wages for the work done on scientific lines under white supervision."

It is, therefore, largely a question of getting the right man, or men, to give the practical instruction which is necessary to convince the ignorant, and, therefore, impoverished, tiller of the soil. As a correspondent recently stated in a letter to us *re* this question of fertilizing, the impecunious native is slow to even think of expending money on fertilizers which to his uninstructed mind seem very dear and of doubtful utility. In addition, it is against his old-time traditions to take any initiative. Once he is shown, however, that he can make it *pay*—and shown by the right man, who can gain his confidence—then he will gladly take the plunge and try the modern methods.

There is naturally a great deal of spade work to be done before such a result can be obtained, but we are convinced that it *can* be done, and with advantage to the country, the people, and indirectly to the whole world.

A certain amount of credit, some co-operation, practical instruction, and an enterprising group of fertilizer dealers will do much; and if only the Government lends its assistance there need be no doubt about the final result.

Above all things it is essential to make a good beginning, and in a country like India there is nothing like practical demonstration. Show the native in his own district, and on a sufficiently practical scale, the effect of judicious fertilization—show him the small extra cost at which such results can be reached—and prove to him that the outlay is remunerative, then the battle is half won, provided the "right man" is in charge. It will, however, be more or less a waste of time unless fertilizers can be obtained at a fairly reasonable rate when required. It is not much good teaching a man to use things which he cannot get except with great difficulty and at a prohibitive price. On the other hand, it is not to be expected that merchants should keep stocks at various centres in the hope that a demand may spring up. At first, then, some assistance will undoubtedly be required, not only for the purpose of instructing the cultivator, but also to induce manure dealers to be ready to supply the necessary fertilizing material at a reasonable price. It is, therefore, imperative that any such undertaking should have the practical support of the Government.

It is not within our province, nor do we presume, to do more than suggest the bare outlines of such a scheme, but we are confident that if the support and goodwill of the Government of India were assured there would be no lack of private enterprise in a movement which, quite apart from its economic value, must have an enormous commercial future before it from the point of view of the producers, and therefore of India itself.

The Cost of Making Copra.

THE paragraph on p. 89 in our May issue, quoting the cost of making copra in Queensland as being £18 a ton, caused us to receive several calls, as well as a good many letters, from those either good enough to fall in with our suggestion and give us their estimates for making copra, or from others who wished for further particulars for their own guidance. As a result of the information received and discussions to date, we have been able to confirm our own opinion that if copra costs £15, £18 or any other sum c. and f., this amount can roughly be divided into three equal parts. One third would be taken up in the cost of upkeep of large estates, for such areas as are in bearing, provided they were in good order to start with, and needed no exceptional expenditure, as heavy weeding or drainage during the year. One third for picking the nuts, and transporting them to the factory, for husking, splitting, removing the meat, drying the copra, and bags and bagging for shipment; whilst the last third goes for transport to the export ship and freight across. For copra to cost £18 a ton, the labour as in Queensland must be excessive, or else the cost would come in the transport to the coast owing to the estate being in a district situated a long way from the sea-board. To our mind, for estates of 3,000 to 5,000 acres, or at least 2,000, and the entire area bearing, £15 per ton c. and f. should be, as a rule, a fair average cost for copra, for whether you pay a shilling a day for labour when making the copra, as to some Malays, or about fourpence a day, as with Kaffir or other cheap labour, as in Africa, the cost per ton works out much about the same, a good Malay being equal to three indifferent Africans.

If this is correct, and allowing 2,000 nuts per acre (trees 30 ft. apart), and 6,000 nuts per ton of copra, an estate would cost one third of £5, or £1 13s. 4d. an acre for general upkeep. If the nuts were so large as to need only 4,000 to make a ton of copra (an estimate that we find too low, especially for large estates of 3,000 3,000 acres), then it would be extremely doubtful whether the copra would cost less to produce, as the nuts would only maintain their size owing to better cultivation and liberal manuring, which would run the cost up to 50s. an acre, and hence the same 100s. for the two acres necessary to produce 4,000 nuts.

When scientific cultivation by means of power tractors, ploughs, and cultivators and manure spreaders supersedes the present low-class labour engaged in "chipping" or hoeing the land, it will be interesting to see how the cost per 100 or 1,000 acres compares with present rates. In Portuguese East Africa "chipping," we are told, costs 5d. per day's task (half an acre), or 10d. per acre. This is done three times a year, so costs 2s. 6d. an acre, plus the same amount for other expenditure, making 5s. an acre per year for work other than exceptional expenditure. Let us, therefore, work out the cost of a coco-nut estate of 3,000 acres based on the Portuguese Africa basis; and having done this, we hope others still on the spot, and especially those in Malaya, Mexico, Malabar, Ceylon, &c., will criticize our figures and compare them with their own. A coco-nut estate, all bearing, of 3,000 acres would need the following labour and expenditure in Portuguese Africa:—

	Per annum
1 white manager's (or owner's) time	£800
2 under-managers at £250 and £200	450
20 drivers or overseers (equals one to 150 acres) at £5 a month or £60 a year	1,200
200 labourers (1 to 15 acres) with women and children. If there is not one woman and two or three children to each man then 250 labourers (or 1 to 12 acres) at 5s. an acre ...	750
1 white bookkeeper	250
2 clerks (native) at £100 year	200
Total for upkeep, for labour only, exclusive of manure, machinery, implements, &c., equal to about £1 4s. 4d. an acre	£3,650

This area (3,000 acres) in bearing should give (at 2,000 nuts to the acre, and 6,000 nuts to the ton of copra) 1,000 tons of copra costing £3 13s. 4d. ton, as above for upkeep; add another £1 5s. 8d. ton, or £1,350 a year for renewals of supplies, &c., wear and tear, and sinking fund for labourers' buildings (if any), cultivating implements, and estates supplies, &c., and contingencies, makes the cost of producing 6,000 nuts = 1 ton copra, exactly £5. In the estimate for making the copra must be included depreciation or sinking fund on buildings, machinery (if any), labour, say, 65s. ton, bags and baggings, 10s. ton, plus at least £3,250 interest on capital value of the estate (3,000 acres at £25 = £65,000) = £1 5s. a ton, whilst £4 out of the third £5 would go for transport, freight, &c., and £1 contingencies = £15 ton in all c. and f. Suppose the copra costs £12 only, or £18, then we still suggest that these same three-thirds for estate work, copra-making and interest, transport, and contingencies would remain pro rata. In the above we have not calculated anything for coir-fibre or other by-products, nor for catch-crops, either their upkeep or profit, but for cost of producing the coco-nuts and making and transporting copra only, and that from trees that are practically in full bearing.* Now we have made the start and shown our hand, it is up to others to explain where we are wrong, or confirm our statement where we are right. We ask one and all to do so.

The director of the largest plantation coco-nut concern in Portuguese Africa, if not in the world, maintains, however, that the above figures are much too low, and such an authority as an owner of estates and a large employer of labour is bound to take first rank for consideration. On June 14th last this authority wrote us from Marseilles: "Your figures are too low; according to our experience, you must reckon for 3,000 acres, 300 men during six months for picking and transporting the nuts, 200 men for the same time for opening and drying, 200 men for the other work, as bagging, &c. In all, therefore, you need at least 700 men for six months. Besides this, you must further reckon 300 men for the general upkeep of the estate, tending the land, cattle, &c., draining, removing dead leaves, repairs to bridges, *extermination of pests*" (our friend heavily underlines these three words) "and the other work, as on a farm, and this labour force is required for the whole year." By this one must take it that at least 1,000 men are needed, or one man to three acres planted and bearing. The friend who gave us the first set of figures is now in Africa. As soon as he returns we will hear what he has to say and revert to the matter again, probably in August.

* See May issue, p. 82, as to why the estimate of forty-two nuts per palm fell to only thirty-three nuts, not forty nuts, as we have estimated for, and which is rather a liberal allowance per tree.

Reviews.

AIDS TO TROPICAL HYGIENE. By Major R. J. Blackham, R.A.M.C. Price 3s. net. 192 pp., including Index and Appendices. Baillière, Tindall and Cox, 8, Henrietta Street, Covent Garden, London, W.C.

Those interested in the progress now being made in medical research throughout the Tropics will remember that we devoted the cartoon and leading article in our February issue to supporting Major Sir Ronald Ross's claim, made in his lecture delivered before the Fellows of the Royal Colonial Institute, *viz.*, "that bar which has prevented the overflow of civilization into the Tropics will be removed. I can foresee great cities and prosperous rural areas under these benign skies which hitherto have been thought so deadly to life. The Tropics have a hot climate supposed to be unsuited to Europeans, but we can scarcely conceive that the extreme cold of Canada is better suited to some of the European races."

Reading the author's preface to the book under review confirms what we then claimed, although at the time our views caused some surprise to our contemporaries, including the London press, which commented on our remarks. "It is probably much more possible for white men to colonize a tropical country than is imagined," writes Major Blackham, quoting Meredith Townsend's "Asia and Europe," "especially if the colony was so organized that sanitary laws could be enforced from the first. Whatever," continues the Major, speaking off his own bat, "may be said on the subject of actual colonization, one point is universally conceded, *viz.*, that by the knowledge and application of hygienic principles, the health of white residents in the Tropics may not only be conserved, but maintained in full vigour for prolonged periods."

To this we say "Hear, hear!" and base our experience on those around us who have lived long and strenuous lives in tropical centres, starting, too, before Major Ross was born, and long previous to any question of sanitary laws and precautions. Following on the generation of those who "stood it out" we can, however, fully appreciate the modern efforts to make the Tropics as healthy as Nature herself means them to be, provided those living there take the same precautions as is done in the temperate countries. What these precautions are, either as regards ventilation, water-supply, feeding, clothes, housing, pests, &c., &c., Major Blackham in a concise but easy and well-arranged manner explains to those who are wise enough to buy his little book, which only costs 3s., and can easily be slipped into the breast-pocket of any jacket. Anyone bound for tropical regions who does not possess himself or herself of so handy and reliable an aid is likely to repent its absence before long. We certainly would recommend them to purchase a copy in advance and so prevent trouble, rather than to wait until trouble arises when, at the best, they can only remedy it.

THE last *West Indian Bulletin* to hand (vol. xiii, No. 2, 1912) contains some useful reports on sugar-cane experiments in British Guiana. Accounts of previous experiments were submitted at the Trinidad

Agricultural Conference of 1905, and at the Barbados Conference of 1908; and those now issued carry the record of the work up to January, 1912. Pages 98-177 deal with manuring, and contain much valuable information. Pages 177-218 discuss the varieties of sugarcane, their suitability for various soils and conditions, and their deterioration. Messrs. Dulau and Co., of 37, Soho Square, London, W., have the *Bulletin* for sale, price 6d., postage extra, and it is well worth buying.

WE gather from Mr. Frederic I. Scard's new book, "The Cane Sugar Factory," that we have to welcome the West India Committee among our ranks as publishers. This we do with much pleasure, and wish them every success. Judging by the price charged for this book (1s. net), with its 117 pages of matter, and strong cloth cover, they will not, we fear, grow rich over this new departure; but, then, that is to the advantage of the purchasers.

Under the form of a catechism, or dictionary of terms, we are introduced in an easy manner to the intricacies of the milling and making of cane sugars and the terms employed in connection with the various machines and processes that its manufacture involves. As journalists we welcome such a book for reference, and anyone interested either in the machinery or the making of sugar will be equally glad to secure a copy once they realize its utility and simplicity, the tables giving metric equivalents of British weights and measures being by no means the least useful portion of this handy little book.

MR. J. N. HARPER's (Director, Agricultural Station, Clemson College, S.C.) pamphlet on "Tobacco Growing" will fill a long-felt want expressed by many of our readers, who are on the look-out for a handy set of instructions as how to plant and prepare tobacco for market. The report concludes with a list of twenty-eight works dealing with tobacco, its production and preparation. No price is mentioned, and the United States Department of Agriculture, Washington, are the publishers of this eleven-paged pamphlet.

THOSE of our readers who have derived benefit and pleasure in the past from former publications in the shape of "Truth's Cautionary List," and "Queer Stories from Truth," will do well to write for the latest issues of these two books, published by Truth office, price 1s. each, postage extra.

THE International Rubber Congress and Exhibition to be held next year at Batavia (Java) will be open from September 8th to October 10th, 1914, whilst the Congress will, we understand, last from September 7th to 12th. All correspondence concerning the Congress should be addressed to Dr. C. J. J. Van Hall, Secretary of the Congress Committee, Buitenzorg, Java. Applications for exhibition space, addressed to the Secretary, International Rubber Exhibition, Batavia, must be sent in not later than November 1st next (1913).

"ON March 19th a most interesting meeting was held with Mr. J. Stewart J. McCall, the Director of Agriculture for Nyasaland, and on April 18th there was a meeting with Mr. S. Simpson, the new Director of Agriculture in Uganda. The Council attach great importance to these meetings, and they are convinced that they are of the greatest utility to the cause of cotton growing." So states the eighth annual report of the British Cotton Growing Association for the twelve months ending December 31st last.

Knowing both Mr. McCall and Mr. Simpson we agree with the directors' opinion, but at the same time we regret to see that there is no sign of any dividend as yet to show that the Association has made a commercial success of the large sums of money entrusted to the directors' care. As it is there is another loss of £11,354, on the top of the deficiency of £25,183 in 1911. Evidently abundance of capital is not conducive to success in cotton planting. The Association appears to enjoy the confidence of the Government, but those who were willing to wait seven years for a dividend must feel very sore that their patriotism has been so poorly repaid. It is all very well to talk glibly up in Lancashire about supporting the cotton industry, but this scheme of all "give and no get" does not appeal to us at all as practical men of business, and we cannot congratulate the Association either on this or its previous reports.

AT a meeting of the Committee of Agricultural Experiments, at Peradeniya (Ceylon), the question was raised whether it was considered necessary to blast out all the stumps in the new rubber clearings. It was decided after discussion to remove the largest stumps in the Peradeniya clearing and old stumps in the Heneratgoda clearing. Regarding the best distance for planting cacao, the Hon. Mr. (now Sir) E. Rosling suggested 16 x 16 ft. for the new clearing, and Mr. Coombe urged wider planting; at least 20 x 20 ft. It was decided to try plots of both.

It was proposed to publish the result of the cacao-manuring experiments, and also those carried out to test the *pros* and *cons* of shade with cacao. Such reports will be watched and read with interest.

The question of mechanical transport continues to be vigorously discussed in Ceylon, where hoof and mouth disease and recurring rinderpest had become so bad that further delay in the matter of motor transit was becoming dangerous. When, the planters were asking, would the Government run a motor lorry in the Udupussellawa district?

Another suggestion thrown out was that an experiment should be made with a wire ropeway in the district (Udupussellawa, noted for its tea gardens) for transit purposes.

WE are informed that the business of Messrs. Frank Field and Co. has now been merged into the firm of Messrs. C. M. and C. Woodhouse, with which it has been closely associated for the past seven years, Mr. Marks becoming a partner in Messrs. Woodhouse's firm.

INDIAN TEA ASSOCIATION NOTES.

The Utilization of Tea-Seed for Soap-making, &c.

SINCE writing in our May number on the question of the utilization of tea-seed for their oil content, we noticed in *The Wealth of India* for March (p. 200, B 253) that a London firm is desirous of communicating with exporters of tea-seed oil, known also as Camellia oil. Whether their inquiry will receive any response just yet seems doubtful, as planters maintain that the good seed is all needed for planting, and that the common China seed, as in Assam, does not pay to collect. This has yet to be proved when hard times come.

The *Indian Planters' Gazette* also gives some useful information on the subject; unfortunately, we neglected to take a note of the issue from which we extracted the following:—

"It would appear that, while tea grows wild in many parts of Burma and is used for pickling in Upper Burma and the Shan States, no one in Burma seems to extract oil from the seeds. Dr. Watt, in his 'Economic Products,' tells of one kind, *C. sasangua*. This small leaved species has sweetly-scented red flowers, the odour of which is supposed to be communicated to the neighbouring tea leaves. Sometimes, however, the leaves and even the petals are plucked and mixed with tea in order to produce a favourite scented mixture. The oil from the seed of this species has an agreeable odour, and is used for many domestic purposes. It is obtained first by cold pressure, the pulp being boiled and again pressed. The leaves are largely used by Japanese ladies for washing the hair. How far the art of perfuming teas in China is carried seems uncertain, but it is possible some of the special brands may owe more to the flowers of this plant than is at present understood. It was introduced into Europe in 1811.

"*C. caudata* (Wall.).—A smallish bush found in the Bhutan, Mishmi, Khasia and Sylhet hills, and in Martaban, at altitudes from 3,000 to 5,000 ft. above the sea. This species is apparently not used for any industrial purpose, but is recommended as worthy of careful investigation as a possible source of improvement to the cultivated tea-plant.

"*C. drupifera* (lour) formerly known as *D. oleifera* (Wall.) Syn. *C. kissi* (Wall.).—A large evergreen shrub, with slender, much divided branches, met with in Nepal and on the Eastern Himalaya generally, in Bhutan, the Khasia hills, Northern Cachar hills, Manipur, Tenasserim and the Andaman Islands at altitudes from 3,000 to 8,000 ft. above the sea. This plant is closely allied to the sweetly-scented *C. sasangua* of China and Japan, to which allusion has been made, as cultivated in China near the bushes in order to afford shade, and to impart to the leaf the sweet scent of its flowers. This species has never been cultivated in India; but apart from any possible service it might be found to render in the direction of the improvement of tea through the production of a better hybrid, this plant would seem worthy of attention as an oil-seed bearing species. Without any appreciable extra trouble this species might be reared as a hedge, and yield a fairly remunerative oil crop at

the same time. The seeds yield a very large amount of a non-drying oil of a superior quality. The oil is used medicinally in Cochin China, and with the oil from *C. sasangua* is no doubt largely sold as tea-seed oil. The latter article is of considerable importance to the tea districts of China and is exported to Europe. It resembles olive oil, burns with a clear bright light, and is free from unpleasant odour. *C. drupifera* was introduced into Europe in 1819. It would appear that in Burma and the Shan States the leaves are only used for pickling, and no use is made of the seeds for oil."

In reply to our inquiries addressed to the leading oil-machinery engineers, Messrs. Greenwood and Batley, Ltd., confirm the report that the oil answers well for soap-making, producing a hard white article, the presence of the saponin being in no way detrimental, but, on the contrary, it increases the lather and the cleansing action of the soap. Tea-seed oil also could be used as a fine lubricating oil for watches, &c., and is said to be used in China and Japan as a hair oil.

The main drawback to the utilization of this oil on a large scale seems to be the unsuitableness of the cake for feeding purposes on account of its poisonous quality, and the low percentage of protein is further against its being much used for manuring purposes, but the cake could be used in place of Panama bark as soap substitute.

With regard to the crushing and pressing of this seed there ought not to be any difficulty, a No. 1 self-contained Universal oil mill, price £240, should obtain the maximum yield of oil with twice pressing.

Changing the subject, we were asked the other day to give a formula for a tea fertilizer, so sent the results, as follows, of an experiment on tea carried out in India. As they have not yet appeared in print so far as we know, some of our readers may be pleased to see them. The quantities of manures used in this experiment are about the same as those which we recommended in our March issue (p. 46).

MANURING EXPERIMENT ON TEA.

Carried out by Mr. A. J. G. Cresswell, Rampor Tea Estate, Daloo, Cachar.

Manuring per acre	Plot 1	Plot 2	Plot 3
	Unmanured	5 mds. oilcake	2½ mds. oilcake 56 lb. mur. potash 112 lb. sulph. ammonia 136 lb. basic slag
Yield per acre { Leaf	2,209 lb.	2,537 lb.	2,724 lb.
Tea...	552½ lb.	634½ lb.	681 lb.
Increase over untreated per acre	—	82 lb. tea	128½ lb. tea
Value of increase per acre	—	R. 35 A. 14 P. 0	R. 56 A. 5 P. 3
Cost of manuring per acre	—	10 0 0	25 6 3
Profit due to manuring per acre	—	25 14 0	30 15 0

As can be seen by p. 111, there is some chance of the Japanese carrying out experimental plantings of tea in the Iguape district of Sao Paulo, Brazil. It will be interesting to watch the progress of the scheme

generally, both for this reason, and as one way of getting over the South American labour difficulty.

Tea planters will be interested in the book on the "Fermentation of Cacao" that we shall shortly be issuing, as Dr. Oscar Loew compares the effects of the oxidizing enzymes in tea with those in cacao fermentation, whilst he and other writers, whose essays will be included, also discuss the oxidation processes in tobacco, coffee, and indigo. As Dr. Loew was attached to Tokyo University for some years, he had special facilities for studying the preparation of tea for export.

There have been a few early arrivals of new season's invoices from Darjeeling, which were of fair average quality and realized full values.

Calcutta sales opened on June 4th with a good general demand, Russian buyers operating freely.

Reports from the producing districts are somewhat unsatisfactory, and the effects of indifferent weather are reflected in export figures.

A commendable progressive policy by the Administration of Assam to exploit its forests to meet the growing demand for timber for railway purposes has been noticed with satisfaction and must prove of immense value to the Province.

A further conference between the Government and representatives of the two valleys, called at the instance of Sir Archdale Earle, the Chief Commissioner, to discuss the important question of communications was, it is noted, fixed for June 1st, and should be productive of very useful results.

The Annual Assam Dinner was held on June 3rd, at Holborn Restaurant, was largely attended.

In respect to Indian tea in London, Messrs. Wm. Jas. and Hy. Thompson reported at the beginning of June that there was nothing of interest to record beyond the appearance of a few early arrivals of New Season's invoices from Darjeeling, which were disposed of in auction; quality was fair average, and the teas met a good demand and realized full values. As usual at this time of year, the sales were chiefly composed of Southern Indian teas; there were, however, three invoices of New Season's teas from Darjeeling, which met a very ready sale at satisfactory prices, and the balance of the offerings were of a nondescript character, being a "selection" of odds and ends, second-hand, and Calcutta bought teas, which gave no indication of market movements. The Southern Indian teas, however, were in good demand, more particularly whole-leaf grades, the better qualities of which were inclined to be dearer; for other kinds the market was rather irregular, but on the whole may be quoted about steady. Among the highest averages were: Darjeeling—Bloomfield, 1s. Travancore, Wynaad and Nilgiri—Kalaar, Letchmi and Devicolam, 9 $\frac{3}{4}$ d.; Nonsuch and Gundamallay, 9 $\frac{1}{2}$ d.; Munaar and Daverashola, 9 $\frac{1}{4}$ d. The average for the whole sale on garden account (June 5th) was 8 $\frac{5}{8}$ d. per lb., compared with 8 $\frac{3}{4}$ d. per lb. a year ago, whilst the average for Ceylon was 8 $\frac{7}{8}$ d. per lb. against 9d. a year ago.

FOLLOWING on a series of articles on "Coco-nuts," by Dr. Fredholm, "Bananas," by Mr. Fawcett, the *West India Committee Circular* now includes the last word on "Cacao Planting," by W. M. Malins Smith, of Grenada, a leading authority on the subject.

Green Bug (*Lecanium Viride*) in Coffee.

HAVING published the illustrated page article that we included in last month's issue on the increasing demand for spraying machines, and the illimitable possibilities of further extending their sphere of usefulness, we were glad to see the following letter addressed by Mr. A. A. Brown, of Carolina Estate, Coonoor, S. India, to the *Madras Mail*, as it confirms all we have ever claimed as to the anxiety of experts, and others who can realize what spraying machines can do for estates and the money they can save by freeing the trees and lands from insect and fungus pests, to see them introduced everywhere and made good use of. Mr. Brown wrote:—

"I see that green bug has made its appearance on a couple of estates near Saklasapur, and that our worthy scientific officer is advocating the 'knapsack sprayer.' I can fully endorse his recommendation, as I have had personal experience with the same. I have a block of seventeen acres of coffee, which I have had the sprayers working over for the past four years, using a decoction of soda and rosin, which prescription has already appeared in your columns. The sprayers have been the means of salvation to this estate; I had estimated two tons of parchment for the 1912-13 crop, and have already picked 188 bushels, which leaves very little more to make up the estimate. I am sure we would have had to cut the whole lot of the coffee out had it not been for the timely use of the sprayer. The trees look as healthy as ever, and I am almost sure of picking the same crop over again. If anyone wishes to call over I shall be only too pleased to take them round."

Dr. Willis, when Director of Agriculture, Ceylon, advised planters to have at least two spray machines on each estate; one for use, and one for emergencies, times of extra pressure, and especially for breakdowns in the one in use.

"Tropical Life" and "Farming by Dynamite."

WE have, on more than one occasion, called attention to the publicity given to the paper that our Editor had the pleasure of contributing to the New York Rubber Conference last year. We are glad to have been able to do so, for the more the subject is ventilated and discussed the better we feel it will be for the planters. We take this opportunity of thanking our contemporaries for having helped us to give the matter such widespread publicity.

Beside the original publication in the April issue of the *India-Rubber World*, of New York, we have noticed that *Grenier's Rubber News*, of Kuala Lumpur, F.M.S., the *Planters' Chronicle*, of Bangalore, Southern India, and the *Indian Planters' Gazette*, of Calcutta, were among those which have reprinted the article. We trust others will continue the discussion where we left off, for having been reproduced over so widespread an area, copies can be obtained by most of our readers, or, as we have a few copies of the *India-Rubber World* left, we will send a copy post free on receipt of 1s. 8d. They can also be obtained from the *India-Rubber World*, New York, price 36 cts., postage extra.

Economic Zoology.

Our Motto: "Utilization, not Extermination."

Conducted by FRANK FINN, B.A., Hon. F.Z.S.

PLUMAGE BIRDS AND TSETSE-FLIES.

DURING the past two or three months an interesting correspondence has appeared in the *Times* dealing with the exploitation of tropical birds for plumage, especially with reference to the supposed increase of tsetse-flies in Africa consequent on the destruction of birds for the trade.

Sir Harry Johnston has maintained that "in Africa, especially in West and Central Africa, the principal—almost the only—foes of the tsetse-fly are the glossy starlings (and ox-peckers), the bee-eaters, the halcyon kingfishers, the rollers, the white and smaller herons, above all (including the several species which supply egret plumes), guinea-fowl, francolins, quails, snipes, plovers, pratincoles, swallows, swifts, fly-catchers, shrikes, barbets, drongos, the smaller cuckoos, the trogon, and certain rails." Many of these birds are of dull colours, and are not of any use to the plumage trade, *e.g.*, ox-peckers, francolins and quails; the last two are game-birds and killed for food. The trade's representatives also reply that most of the species mentioned "do not figure in the supply to this, or any other market." Sir Harry Johnston denies this, and asks if the trade have studied the writings of Mr. E. E. Austen (of the British Museum) on the tsetse-flies, &c.

In reply the plumage trade representatives quote a letter from Mr. Austen, in which, while expressing himself as "utterly opposed to the slaughter of birds for the purposes of personal adornment," he says: "There is, unfortunately, nothing to show that the attacks of such birds are capable of keeping the flies in check or producing any material diminution in their numbers." He therefore thinks "the alleged increase is not due to the destruction of birds." They also quote Professor Robert Newstead, F.R.S., as saying: "To the best of my knowledge there is no authentic evidence to prove that the destruction of birds in any part of Africa has any bearing upon the increase of tsetse-flies. Moreover, I can definitely state that insectivorous birds are not known to prey upon tsetse-flies to any marked extent." Similar evidence is quoted from a letter from Sir David Bruce, at present with the Scientific Commission of the Royal Society in Nyasaland. He even says: "As a matter of fact, I have never, at any time, seen a bird catch a tsetse-fly. In 'fly country' there is, as a rule, a dearth of birds. They have so many enemies—snakes, birds of prey, the mongoose, wild cats of various sorts, &c.—that it must be difficult for them to bring the rearing of their young to a successful termination."

In what he calls his final rejoinder, Sir Harry Johnston sticks to his guns, and says that the birds "are, in fact, in common with certain lizards, the only effective enemies of the tsetse-fly," and that he has personally noted the eating of tsetse-flies by almost all the species mentioned in his first letter.

He also points out that Mr. Austen has never, so far as he is aware, been in West or West Central Africa, nor has Sir David Bruce, to the extent that

he has himself. Such an objection would be reasonable enough if he had not himself recommended Mr. Austen as an authority to be consulted, while Sir David Bruce has certainly some claim to be heard on the subject.

What the last gentleman says about the enemies of birds is very important and should be followed up, for whether the birds are to be preserved as tsetse-fly exterminators, or for the plumage trade, or for their own sakes, it is evident that it would be expedient to carry on a campaign against these enemies, which are what our gamekeepers would rank as vermin.

We have, to a great extent, got rid of vermin in Britain, with the result that game-birds are far more numerous than they would be without our help, and there is no doubt that the protection thus given to them has been highly beneficial to insectivorous birds also. Moreover, these enemies of birds are enemies also to lizards, which Sir Harry Johnston, no doubt rightly, claims as tsetse-destroyers also.

Everyone will admit that one cannot burn the candle at both ends, in zoological matters as well as elsewhere; if there is a constant drain on a species for any purpose, kept up by man, and the wild enemies of that species are at the same time allowed to multiply unchecked, the numbers of the said species are bound to go down, if not to the extermination limit, at any rate to a point at which it ceases to be of use to anybody, either as a pest-destroyer or a source of revenue. It would seem, therefore, that what is needed is the creation of a force of wild-life preservers in Africa and other wild countries, whose occupation should be the keeping down of the enemies of useful birds, animals, &c. Of course, there will then arise an outcry against the destruction of the vermin; but this will proceed from a few only, and will not be powerful. Moreover, the lovers of vermin can console themselves with the reflection that nowhere in these highly-populated islands have vermin been exterminated, so that there will always be some left for those who are lovers of destructive animals and birds.

HYBRIDS BETWEEN HUMPED AND COMMON CATTLE.

In the *American Naturalist* for July last year, Dr. Robert K. Nabours gives some interesting notes on the results of crossing the zebu, or humped ox of the Eastern Tropics, with ordinary cattle, from observation on the herds of Mr. A. P. Borden, of Pierce, Texas. From these it appears that the first cross between the zebu bull and common cattle of European type (grade Herefords and Durhams) favours the latter chiefly; when the hybrid beasts are bred with each other there is a reversion to one or the other type, so that as far as the experiments have gone there seems to be no blending of the two forms of cattle.

Two important economic advantages are, however, gained in the first cross; the hybrids, like the zebu, are not infested by the ticks which are such a pest to ordinary cattle in warm parts of America, and they are about 50 per cent. heavier than ordinary range cattle in the region above mentioned, though feeding on the same pasture.

Moreover, the zebu bull, it is stated, will put 75 to 80 cows in calf in a season, as against 25 to 30 cows impregnated by a native or high-grade Hereford or Durham bull.

The advantages of the zebu cattle for hot climates are well known to all who are acquainted with the East. They bear heat much better, seldom seeking shade and not standing in water; they are very gentle and quiet compared to our cattle (though apt to show a dislike to Europeans), and are very much more active in their paces. I do not consider the beef quite as good as that of our cattle, as it is not so rich in flavour; but the hump, which is marbled with fat and lean, is very good, and is commonly eaten as a cold boiled joint in India. On the other hand, zebu cows are not such good milkers as European breeds. I should advise breeders to try crossing the zebu bull with Jersey cows, and *vice versa*, to see if the milk yield can be increased in the cows; their brothers ought to make good steers even with the small Jersey parentage on one side, if the great increase of size comes out in the hybrids of this cross also. How far the good points of both types of oxen could be blended, in view of the segregation in the progeny of the inter-bred hybrids, is doubtful, but there seems no doubt of the advantage of making the first cross.

EGRET FARMING.

A Ceylon correspondent wishes for information about this, but I do not know of any institution to the procedure of which I could refer him, and can only say how I should proceed to start an egret farm if I had a Ceylon estate. The whole thing is quite an experimental idea at present, but ought to present far less difficulties than ostrich farming, as the birds are so much smaller and not unwieldy or dangerous, *except that they strike at the eyes when cornered*. Accommodation should first be provided in the form of a large shed with rain-proof roof and sheltered from high winds at whichever quarter they may be expected; wire-netting will do for the other side or sides. A number of wooden frames on short legs, like the framework of a native bedstead, only with a couple of spars across instead of the netting, should be provided as perches. The idea of having these instead of fixed perches is, of course, to facilitate cleaning, and they must be low, as the birds should have a wing clipped, for reasons to be explained directly.

The floor should be bedded with any material which is convenient and will blend well with the birds' droppings to form manure; this ought to be an item of some value, being of a similar type to fresh guano. To put the birds in an aviary would be a needless expense; I should clip one wing of each (cutting all the quills at about their middles) and let them go loose during the day, when they had got fairly tame. At night they should be shut in the shed to keep them safe from vermin and secure the manure.

A boy or two ought to be able to keep them from straying; but if this is not possible, a wire-netting fence about 6 ft. high should suffice to confine them. If they climb it, a foot of overhanging wire, inwards, should be placed along the top.

If there is water on the estate the shed should be near this, and the enclosure (if any) include a part of it. If not, some large pans should be provided, cleaned and refilled with water *every* day. But water is only really needed for drinking or an occasional bath; the only real trouble is food, the birds being purely animal feeders. If they can go at large, they will find

much of their own food, especially where there is water in which they can catch fish, frogs, &c., but they also may be expected to feed on insects, mice, lizards, sparrows, &c., so that even in the absence of a natural water supply they can find some food, and as they will damage no crop they may be allowed to roam anywhere. Some artificial food will have to be given if a number of these birds are to be kept anywhere, especially away from ponds, &c. This is best in the form of small fish; failing these, large fish chopped up, or meat, also chopped, must be given. The cleanings of fowls, sheeps' lights, &c., washed and chopped, may be found to serve; some experiment will have to be made as to the cheapest artificial food that will serve, as on this point most of the success of the venture will depend. The birds should be fed once a day, before going to roost. Birds captured at this time of the year will probably have no plumes, but may be expected to assume them next spring. As soon as the plumes are full-grown they should be clipped off; the birds should be secured in a landing-net, and their necks taken hold of at once, to prevent their striking one's eyes. The wings will want re-clipping every year after the moult. I do not recommend pinioning, for fear of the shock to the system, which might hinder the growth of plumes.

Of the three white egrets found in Ceylon the middle-sized one (*Herodias intermedia*) would be the best to keep, as it bears a large number of excellent plumes, and is more sociable than the other species. Young birds can be reared from the nest on fish and frogs, or chopped fish and meat; old ones should have live fish given them in water when first captured, as they may be inclined to sulk and not feed freely. Egrets will live for years in captivity if well treated, and they may breed; if seen carrying sticks they want to nest, and any site they choose should be protected with netting. Some flat baskets fixed on branches thrown on the ground may give them the hint, or such baskets may be fixed on the roosting-frames. The young remain in the nest, and the old ones must be given extra food to feed them with, small fish or frogs by preference.

ACCORDING to the *Daily Telegraph*, Dr. W. Yorke, of the Liverpool School of Tropical Medicine, in the course of a lecture delivered on June 9th, before the members of the African Society, at the Royal Society of Arts, John Street, Adelphi, Sir Alfred Sharpe, K.C.M.G., presiding, on the subject of "The Relation of Big Game to Sleeping-sickness," urged in regard to the association of the sleeping-sickness disease with districts wherein big game flourish with their attendant parasite, the pestilential tsetse fly, the desirability of making an attempt to drive back big game to their original home, in the hope that the dreaded insects would disappear with them. In the discussion which followed it was urged that there was need of great caution before embarking on a policy of the extermination of big game, and that it may be possible to control the disease by combating the tsetse fly itself rather than the big game upon which they live.

Erratum.—In the last issue of TROPICAL LIFE Mr. Dewar was alluded to as "Professor" Dewar. This is incorrect, as he has no such title.



“Tropical Life” Friend.—No. 96.

MR. SADA0 YAMADA.

Director of the *Gomu Sekai* (*Rubber World*), Tokio, ex-Editor of the *Gomu Shimpō* (*Rubber News*) of Japan.

ALTHOUGH not the first Japanese who has figured in our gallery of friends,* Mr. Sadao Yamada is the first to appear in native attire, the costume represented above being present-day dress clothes as worn in Japan. Some of those who, like ourselves, are unable to read Chinese or Japanese, may be interested to know a few words, especially those connected with rubber. In a most interesting letter written in very readable English, “Our Friend,” in answer to our queries, very kindly answered as follows: “Gomu = rubber, comes, I believe, from gum, as Gummi in German. Sekai, strangely, is not written in Japanese, but in Chinese characters introduced from China in the third century, and means ‘world,’ not only in Japan, but in China, Corea, and Formosa.† *Gomu Shimpō* means *Rubber News*, shim = new; po, a report.” The staff of *TROPICAL LIFE*, therefore, feels that it has mounted the first rung of the ladder that leads up to a full knowledge of these difficult languages. It is only to be hoped our Editor (and the Journal as well) will live long enough to learn to converse with our many Japanese readers in their own language.

* The first was Mr. Iida Sohichi, of Yokohama. See *TROPICAL LIFE* for November, 1909.

† Mr. Sadao used Japanese symbols in his notes; these, unfortunately, we cannot reproduce.

Mr. Sadao Yamada was born two months after the Editor of *TROPICAL LIFE* left school, or just about the time when under parental guidance he (our Editor) was busily engaged in drawing up tables of the cost of starting cacao and banana estates in Venezuela for some clients who had a concession out there. When we relate what “Our Friend” has achieved during the whole of his life we feel that events move much more quickly now than they did twenty-five or thirty years ago. Born at Tsushima, Owari Province, Japan, after attending the usual courses of the common and higher grades, first at the primary and then at the secondary schools, “Our Friend” entered Weseda University, Tokio, where, among other studies, he specialized in English literature, for which, in 1908, he obtained a degree. Mr. Sadao’s connection with tropical literature started, we believe, when he joined the *Gomu Shimpō*, of which he was Editor (as well as of the *Gomu-Kenkiurokie* (*Rubber-study*) for three years. He is now a director of the Tokio and Foreign Bureau of the Gomu Sekai Sha (*Rubber World Co.*), and is a regular correspondent of *The India Rubber World*, of New York, and is also making *TROPICAL LIFE* better known throughout Japan, Formosa, Corea, &c.* As “Our Friend” can read, write, and translate Chinese, as well as Japanese, into English, our readers will feel that we shall be well served. Mr. Sadao, who is a member of Mr. Mander’s Advisory Committee for the fourth International (1914) Rubber Exhibition, is now busily engaged in trying to persuade the Japanese Government to reduce the import duty on reclaimed rubber from 20 per cent. to 10 per cent., and, *inter alia*, is starting a new monthly called *Shoko Jiho*, or, in plain English, *Commercial and Industrial Times*. We wish him all success in his journalistic ventures.

As we state in our coming book on the “Fermentation of Cacao,” tobacco, &c., efforts to avoid attacks of the cigarette beetle (*Lasioderma serricorne*, Fabr.) may cause radical changes in the fermentation of tobacco and its preparation either for cigar-making or export. This pest, which causes the well-known “prickings” in cigars, seems to obtain access to the leaves mainly when they have been heaped up and left to ferment, and Mr. Charles R. Jones, in an exhaustive report on the subject, published as Section D of the *Philippine Journal of Science* (vol. viii, No. 1, February, 1913), suggests the use of wire screens and fermenting shelves along the same lines as when mosquitoes have to be kept out. The exhaustive way this authority has treated and illustrated the article, coupled with the importance of the subject, will cause this number of the *Philippine Journal of Science* to be eagerly sought after both by tobacco planters and curers and cigar manufacturers alike. In face of the enormous losses caused by this pest, its habits and how to combat the evil cannot be too carefully followed up.

* Meanwhile, through the kindness of Dr. Cantlie, Editor of our *Journal of Tropical Medicine and Hygiene*, we hope to be favoured with an introduction to Dr. Sun Yat Sen, and through him get into touch with the heads of the Agricultural Department in China, a section in which Dr. Sun is deeply interested. The promise of this arose out of the article we published last September, entitled “When China is Awake,” a copy of which we sent to Dr. Cantlie. This gentleman, it may be remembered, was the friend who, in 1905, was instrumental in securing the release of Dr. Sun, who had been kidnapped and confined in the Chinese Embassy.

Business Notices.

1.—The address of TROPICAL LIFE is MESSRS. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

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5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed to the Manager of the Department.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JUNE, 1913.

Europe and Asia to Meet in Latin-America.

WHILST the German Emperor is reported to have waxed enthusiastic over combating the so-called "Yellow Peril" to Europe, as if, with the awakening of China and Japan, our very hearths and homes were menaced, we have maintained more than once that where Europe and these Mongol races may come into competition will be in Latin-America. We believe the Japanese—not men only, but entire families—are already on the borders of Peru, Bolivia, and Brazil, and have actually been employed as rubber tappers; and we are certain that the day the Chinese start to exploit South America, as they have done Malaya, the West Indies, and many other centres, there will soon be more Chinese than Europeans in the Latin Continent. Once established nothing can prevent them from prospering either as merchants, financiers, or as agriculturists, as the Japanese are doing in North America to the discomfiture of the Californians, who, having sold them estates, and received the money, now want to pass a law to make it impossible for the Japanese to own property. We say this because we know that China is "awake" to the Japanese colonization scheme that has been advanced with a view of establishing Japanese colonies in South America, and especially in Brazil. If this scheme is carried into effect by the Japs, and proves successful, then there is little doubt that the Chinese will follow and the "yellow peril," whether to German or English interests, will be shifted from Europe to America, where the pure white will have to see to it that he holds his own against the Mongol competitor.

A recent issue of *The Chinese Republican* called attention to the Tokyo meeting* of the Brazil Colonization Company, which was presided over by Baron Shibusawa. The syndicate which was formed in

1908 to further this scheme of colonization had noted that the development of Germany and Italy largely depended on the development of their emigration, and the work done by these countries in that direction offered Japan a good example to follow. To Japan it was an absolute necessity to encourage emigration, as their food supply, especially of rice, was already proving insufficient. The best plan to overcome the difficulty, said Viscount Oura, ex-Minister of Agriculture and Commerce, who addressed the meeting, was to find a suitable colony in South America and send emigrants there to engage in productive industry adapted to the soil and climatic conditions of that country. It would open an outlet for the ever-increasing population and contribute to the building up of national wealth. The syndicate was making investigations preliminary to carrying out the object it had in view, and had already arranged to expend a sum approximating 80,000 yen in five consecutive years. The syndicate, having secured from the Government of San Paulo, Brazil, the privilege of a free concession of land covering an area of about 12,250,000 acres on March 8th last, started a plan to form an emigration company jointly with Baron Shibusawa, Baron Kondo, and Mr. Nakano. As the syndicate was organized with the sole object of developing national economic interests, and not individual interests, it would cede its acquired privilege to the new company on its successful flotation. Should the undertaking be successfully carried out with the support of influential business men, which the promoters are anxious to secure, it would be a great impetus to the advancement of national economic interests.

According to Mr. Ikutaro Aoyagi, representative of the Tokyo syndicate, the present scheme was a purely Japanese enterprise, its object being to establish a colony of Japanese settlers and to start Japanese industries on foreign soil 10,000 miles distant, with absolutely national capital and their own labour. The enterprise had been warmly received by the Brazilian public. The State Government of San Paulo, where the syndicate acquired the territorial concessions, enacted a special law for a free concession of state land to the extent of 50,000 square cho, the payment of the passage of Japanese emigrants, and other privileges, to the syndicate. The colony was situated between 24° and 25° N. Lat. on the southern coast of San Paulo, and the climate was mild and adapted to the Japanese, with a temperature ranging between 80° and 90° F. in mid-summer and about 50° F. in the coldest season. The soil was rich and fertile, being especially adapted to rice cultivation. Rice planting was a most promising industry for Japanese emigrants in view of the quality of soil and the special experience of the Japanese in rice cultivation. Moreover, Brazil largely imports rice from abroad, and the market price of the article being as high as 35.45 yen a koku, it offered good prospects for the industry. Pig raising, sericulture, and tea planting, are also hopeful as incidental business for emigrants. To begin with, the company would send 3,000 emigrants, collected by the company; and in future the company would have the assistance of other Japanese emigration concerns interested in the collection of settlers. The company intends to send about 5,000 immigrants annually.

"The Japanese are certainly an enterprising people

* We understand that the *Japan Times* published a full report of this important meeting.

so far as we can judge from the specimens of the race who appear on this side of the water," writes the *Brazilian Review*, of Rio, when discussing the matter. "Their chief characteristic seems to be a constant optimism under all circumstances, combined with an unquenchable hunger for experience and instruction. They take on engagements in any capacity, quickly learn their business, make their 'patrons' teach them the language of the house, laugh on all occasions, become 'cheeky' or go out on the 'spree,' get the 'sack' and sheer off, mentioning as they depart, with a delightful smile, that they will send round one of their countrymen to take the place vacated, and that he 'will be jus' so good as me!' Here is an advertisement from the *Estado de S. Paulo*:—

"Two good Japanese, Cook or Wait Table, having a good experience. Butler or Book-keeper, holding diploma from C.C. Both speak good English only."

"Butler or Book-keeper, Bombardier or Bronchobuster, it is all one to him. No wonder the Americans are afraid of them!

"The 'Japs,' to use their familiar diminutive, seem disposed to profit by the Brazilian Government's invitation to 'come over and help us.' A company called the 'Takushocu Kaisha,' which is, in the vulgar, 'Colonization Company,' of Tokyo, has been formed, whose object is, in the first instance, to found a Japanese colony with headquarters in Iguape, for the cultivation of tea, and perhaps silk. With their usual methodical shrewdness they apparently mean to avoid the course usually followed by certain other nationalities, of loosing a heterogeneous horde of uneducated bucolics to disperse themselves, without light or leading, throughout the territories destined to receive them. On the contrary, they have already dispatched men to search this land of Canaan, as did a certain other colonization company in days of old. An engineer, an agricultural expert, a physician and a staff of assistants are now on their way to S. Paulo; and it seems probable that they will return, like their prototypes above alluded to, with an 'evil report,' saying that it is 'a land that eateth up the inhabitants thereof,' and that all the people are 'men of great stature,' so that the searchers were 'as grasshoppers in their own sight'; 'and so we were in their sight.' Although, to speak sooth as to the last remark, there may be a bit of that too, especially if they happen to take a ramble among the German colonists down Blumenau way! The duty of these pioneers will be to make a thorough examination of the ground to be colonized; and this process being complete and satisfactory, 100 families will form up, march into the encampment and start work. Others will follow, till two thousand families have established themselves, when other branches of cultivation, probably of rice and other cereals, will be undertaken. The whole enterprise, it is understood, will be under the control and supervision of Sr. Ikutaro Aoyagi."

It may be remembered that the South American Supplement of the *Times* of March 25th last also referred to Japan's activities in opening up colonizing centres for her people in South America, and our readers would do well to study what they say in the original. There is a great deal of interest being taken in Japan at present in emigration to South America, reported their Tokyo correspondent. An emigration

steamer is shortly to leave for Brazil, and the Morioka Emigration Co., in conjunction with the Toyo Kisen Kaisha Steamship Co., is at present recruiting emigrants for Peru. The emigrant has to make a payment of £14. Out of this the emigration company takes £2 commission, consular fees are paid, and the emigrant is given 30s. to land with; the balance is kept by the steamship company as fare. The port of arrival is Callao, and much of the work to be done is in the immediate neighbourhood of Lima. Sugar, coffee, cacao and cotton are mentioned as the chief kinds of plantations, and it is also pointed out that there is a very large opening for trade in fish. Fish abounds off the coast, and a great deal of fish is consumed (presumably imported salt fish), but up to the present the local fish industry seems to have been neglected.* . . .

Japan has for some years turned her attention to Brazil as a field for Japanese labour, and recent political events will have a marked influence on this. When Prince Katsura was premier some three years ago a company was formed under the auspices of the Minister for Agriculture and Commerce, Viscount Oura, to acquire some good agricultural land in the State of São Paulo, Brazil, and to settle a number of Japanese upon it. Since the recent fall of the Saionji cabinet Prince Katsura has again been premier, Viscount Oura having the Home Office, and on January 13th a large meeting was held at the premier's official residence in order to proceed with this scheme. A large tract of land has been leased from the State of São Paulo, and it is now hoped to send out some 2,000 Japanese families to settle there. The President of the Nippon Yusen Kaisha Steamship Co., Baron Kondo, is on the committee, as are several prominent business men, so that with this backing the scheme should be a great success. The Brazilian Government is very much in favour of it, and has offered to do all it can to help in every way.

Emigration of Japanese to Brazil has been going on for some time, but this State-aided scheme of sending out farmers and their families to land leased by Japanese owners will give a better status to the Japanese in Brazil, and should give an impulse to the whole emigration movement. Wherever the writer went in Brazil there was always a cry of *falta de braços*, and it is indeed labour that is wanted to open up and make productive much of this magnificent land.

Personally, we wish the movement every success, and would recommend the Tokyo Syndicate not to forget Mexico, nor Mexico, when she settles down, to forget the Japs or the Chinese. The more workers that flock into South America, the better for the countries trading with that continent. Dr. Toledo, Minister of Agriculture, who presided over the last Rubber Congress in Brazil, declared that the rubber grown in the valley of the Amazon would be sufficient to meet the world's consumption, if that region were worked in an economical and practical manner. The learned doctor admits, however, that this would be possible only with a relatively dense population and much better transport facilities than now exist. The Japs, at any rate, suggest a means of overcoming one of these two difficulties, and once the labour is there no doubt transport facilities will soon be forthcoming.

* See also TROPICAL LIFE for September, 1911, p. 181.

The Question of Wide Planting and Cultivation between Rubber Trees.

THE somewhat hurried notes published in April on the advantages of wide planting and cultivating the land between the rubber and cacao, &c., trees have already attracted sufficient attention to cause us to continue the subject, and again include the illustration showing one of the powerful oil tractors manufactured by Messrs. Marshall, Sons and Co., Ltd., Gainsborough, engaged in cultivating the land on an Eastern estate between young rubber trees. The tractor is rated at 16-horse power, fitted with a 2-cylinder internal combustion engine capable of developing 30 to 35 brake horse-power, gearing for two speeds of $1\frac{3}{4}$ and $3\frac{1}{2}$ miles per hour respectively, winding drum, awning, and closed circuit radiator, which enables the engine to work for long periods without the necessity of replenishing the water used for cooling the engine cylinders. The engine is also fitted with a carburettor suited to burn ordinary paraffin. With the exception of the use of a small quantity of petrol for starting up, the engine was run, in this case, entirely on paraffin (always an easily procured fuel), and the consumption was approximately two gallons per hour, in which time about two acres of ground were dealt with.

The cultivating implements drawn by the tractor were two harrows, the one nearest the tractor being of the disc type, 10 ft. wide.

The specific object of the work was to destroy lalang and other injurious grasses which are highly detrimental to the proper growth of the rubber trees. It has been found that by periodically turning the soil between the trees, after it has been once ploughed, two distinct and equally important benefits are derived: One is that the undesirable undergrowth of grasses and noxious weeds is practically eradicated, but at the same time turned in to form a mulch, and the other is that the growth of the rubber trees is considerably promoted, as by loosening and turning over the soil, the trees are able to more readily absorb their natural foods and maintain, even in the dry season, a thoroughly healthy condition. It will be observed from the photograph, which was taken during the dry season, that some of the trees are "wintering," whilst others are bursting into healthy coloured leaves at the tops, the latter condition being due to the particular method of cultivation employed.

The trees shown are planted out about 24 ft. apart by 12 ft., but on some of the other estates we believe that they are set out about 18 ft. apart triangularly. This gives about 15 ft. between the rows, which is ample for working the tractor and implements. Some-

times a five-furrow gang plough is employed, and this implement proves invaluable in the dry season, as during that period of the year the ground becomes so hard that the use of a bullock-hauled plough is an utter impossibility.

Motor traction has solved several of the difficulties attendant on successful rubber cultivation, and any of our readers who may be interested in the industry will do well to consider the "Marshall" oil tractor as an ideal engine for meeting the conditions of service which must be complied with.

Two years ago, when speaking at the London (1911) Rubber Congress, our Editor maintained that it was no use planting rubber (or any other) trees unless you gave them room to expand, and that planters would find it best to obtain a larger trunk and less height.* That was at a time when the tendency was to plant quite close, even 10×10 , 12×12 , and so on. "I submit," said Mr. H. A. Wickham at the same Conference, "that the Hevea has been, and still is, being planted too close for a tree of

its natural order and habit. Powers of growth must be arrested under such spacing, and the setting up of a struggle for existence in consequence of deficient root space which constitutes a serious menace for the future."

As a further and more up-to-date proof of how estates which pay big dividends are adopting wider planting, we would call attention to the last meeting of the

Lanka Rubber Company of Ceylon. Whilst declaring 140 per cent. for the year, and showing an increase of some 19,000 lb. over the estimated crop, the chairman (Mr. H. Tarrant) told those present that the work of thinning out the trees would be systematically continued until they stood at 100 to the acre. Many experts in charge of estates still find suggestions of 200 trees to the acre uneconomical; much more so to have only 100 trees; but, then it should be asked, can any of these show a profit of 140 per cent.? For if not they will be well advised to reconsider the matter, and also the advantages of manuring. An ounce of fact is worth a pound of theory; and here we have facts as to the benefits derivable from manuring in spite of its cost. "A word is perhaps necessary in explanation of the increased cost of production," Mr. Tarrant went on to say, "which I may mention is largely due to the increased amount provided for the liberal programme of artificial manuring which is being adopted, and to the fact that expenditure



Illustration showing the "Marshall" Oil Tractor with a Cultivator attached, at work between young rubber trees on an estate in the East.

* See "The Rubber Industry," Dr. Lierke's paper on "The Manuring of Rubber Trees," p. 177. Price 17s. 6d., post free. TROPICAL LIFE Publishing Department.

on all immature areas is being charged to crop instead of capital account as heretofore."

There seems no doubt that properly and adequately manured trees, provided they are "fed," rather than merely "stimulated," allow tapping operations to be commenced earlier than would otherwise be the case; whilst with the older trees, given room, and a good root growth, the added plant-foods enable them to show a greater increase in girth and to renew their bark more quickly, thoroughly and evenly than is the case with trees that lack one or other of the constituents that go to form their foods. The growth and vitality of the root system are both improved by cultivation and manuring. Rubber trees require nitrogen, phosphoric acid, potash and lime, and experiments show that when these are maintained in the necessary proportions, the flow of latex is more vigorous and the coagulation of the rubber more prompt.

Food, air, and moisture, obtained by cultivation and manuring, are of very great importance in the drier zones, or on lands subject to drought, for, as stated elsewhere, the deeper and more widely the root system is extended, the smaller the chances of the tree being affected by drought, and, therefore, the more even the output, whether cacao, rubber, or other crops, and the less chance of losing trees through lack of nourishment.*

To support Mr. Tarrant as to the distance to plant, we have the last word on wide planting according to Mr. W. F. de Bois Maclaren, the head of the firm that issues the *India-rubber Journal*, and the chairman or director of many rubber companies. Details as to the advantages of wide planting from such an authority therefore should be carefully noted, as no doubt they will be. In "The Rubber Tree Book,"† recently issued from the pen of this authority (whom we congratulate on what we believe to be his first book, and trust that we shall have more), we are told, "20 × 20 ft. (108 trees to the acre) is a distance which has recently come into favour." The spread of the foliage of Hevea trees of various stages in the Federated Malay States, in fair circumstances, is approximately as follows:—

Age of trees	Total spread of branches in diameter		
8-year-old trees	30 feet
10-year-old trees	35 feet
12-year-old trees	40 feet

"When roots can draw their supplies of moisture and of food in solution only from very limited areas, they cannot grow so quickly nor withstand droughts so well, and they cannot have the vitality which they would possess if the roots had an area three or four times as great to draw upon for the necessary supplies."

Mr. Maclaren reproduces elsewhere some remarks made by the Director of Agriculture, Ceylon (Mr. R. N. Lyne), on one of Mr. Wickham's children, viz., one of the original rubber trees sent to Ceylon

after it had been raised at Kew from one of the seeds brought over by the "Father of the Rubber Industry" from the Amazon valley. This tree gave 18 lb. of rubber in a month, and 275 lb. in 3½ years (which, by the way, makes one realize the large yields obtained by the seringueiros at times in Brazil), and Mr. Lyne attributes the ability of the tree to yield these enormous returns to its being able to get a large supply of moisture, perhaps from a subterranean reservoir underground. "Had," he told his hearers, "the root development been encouraged towards the surface instead of towards the deeper layers of the soil, in that case the water-table might never have been reached."

Now, what did we say last month, quoting Dr. Widtsoe? Was it not this: "A good deal has been said and written of the danger of deep cultivation, because it tends to injure the roots that feed near the surface. True, deep cultivation, especially when performed near the plant or tree, destroys the surface-feeding roots, but this only tends to compel the deeper lying roots to make better use of the subsoil. . . . In times of drought the deep-lying roots feed and drink at their leisure, far from the hot sun, or withering winds, and the plants survive and arrive at rich maturity, while the plants with shallow roots wither and die."

This, we would claim, goes to prove the great importance of having your roots deep down in the soil, both with cacao and rubber trees, and all agree that they will never get there unless the trees are wide planted, and—we would add—cultivated frequently between the rows to drive them down. Having driven them down we must, of course, see that they still get their nourishment. "The lateral roots"—again quoting Mr. Maclaren—"have to receive and forward to the foliage the nitrogen and ammonia supplied through the agency of bacteria and mineral salts, and the deeper into the soil the roots force their way, the fewer are the bacteria, *unless* (italics are ours) the soil is well drained and well broken up, as the bacteria must breathe." Had Solomon been a rubber-planter, we are sure he could not have given truer or wiser details than these, all of which go to prove that (1) it is beneficial for the roots to be deep-seated and well down in the ground; (2) to enable them to still draw in their food supplies down there, the land must be well and comparatively deeply cultivated, and therefore widely planted, for which reason alone greater distances between the trees must be the order of the day. Whether it will ever come that, like coco-nuts, rubber trees are regularly planted 30 × 30 ft., or forty-eight to the acre, one cannot yet say, but after reading all that Mr. Maclaren has to say on the subject, it will be no matter of surprise if they are. In all these cases, however, the ground must be covered until well shaded by the main crop, *i.e.*, the rubber. Robusta coffee for its crop; soya beans, ground-nuts, also as crop yielders, or only as nitrogen forming and green manures, must be planted, and in any case the plough and the cultivator must be kept going to mulch the surface and aerate the subsoil, and maybe before long nitrate of soda and the other fertilizers can be applied at the same time by means of drills, to go down nearer to the roots and the moisture, and to avoid waste by being exposed on the surface.

* See "Rubber Planting and Estate Management." By M. Harcourt Paine, Friars' House, New Broad Street, London, E.C.

† "The Rubber Tree Book." By W. F. de Bois Maclaren. 307 pp., 85 illustrations, with full index and list of contents. Price 10s. 6d. net. Maclaren and Sons, Ltd., 37 and 38, Shoe Lane, London, E.C.

SPEAKING at the complimentary dinner given by Sir Owen Philipps, K.C.M.G. (Chairman of the West African Section of the London Chamber of Commerce to Sir Frederick Lugard, G.C.M.G., &c., as Governor of United Nigeria, Sir John Anderson, G.C.M.G., now Permanent Secretary at the Colonial Office, told those present that "the Colonial Office had moved with the times; and, instead of criticizing the acts of Colonial Governors some three or four months after date, they now met those who were practically concerned in the trade and business of the colonies, had more convenient and better communications with the colonies, and more frequent opportunities of meeting those engaged in the administration of the Empire. They had an excellent Colonial service which was keen on its work, sympathetic and intelligent, and their officers understood that they were there to help along to the best of their ability the great movements which were taking place in almost every part of our vast Empire. With those who, like Sir Frederick Lugard, were the men on the spot, the difficulty was to know what to do and how to do it, but at the Colonial Office one of the greatest difficulties was to know what not to do and what to let alone. Perhaps their most serious responsibility was the selection of the men who were to fill posts like that occupied by his friend, Sir Frederick Lugard."

THE Japanese practice of consolidating and bulking together the scattered small-holdings that formerly existed in those islands has caused leading men in India, who are anxious to improve the lot of the Indian ryot and raise the agricultural standard out there, to consider the application of a similar practice in certain districts under their jurisdiction. Raja Pyari Mohau Mukharjee, in a speech he made at Calcutta last September, is reported to have stated that "the most formidable obstacle in the way of agricultural reform is the smallness of ryotty holdings." "In view of the recommendations put forward in the Raja's speech," says the *Agricultural Journal of India* for April (p. 110), in the concluding paragraph of an article on the subject, "it is well for us in India to acquaint ourselves with what has been done in this direction in other countries."

PHILIPPINE Castilloa rubber realized a high price in New York, according to the *Mindanao Herald*, which tells us that the Castilloa rubber sent to the International Rubber Exposition by the Lais Plantation Company, of which Mr. H. E. Peabody is Manager, when sold in New York brought a price only 15 cents (7½d.) per lb. less than fine Pará. The rubber which made up this shipment was gathered by very crude means by untrained labour, and it was by no means a true sample of the Castilloa that can be produced for market with up-to-date paraphernalia and trained labour. The Lais Company is arranging for the necessary utensils and will shortly introduce trained labour on to their property. The company is stated to have 12,000 flourishing Castilloa trees, 4,000 of which will be tapped this year.

To show how much faster the Eastern mails are now sent across to London, we received a letter from Bombay dated May 24th, in time to post back a reply, before 6 a.m. on June 6th, only thirteen days, that is, after the letter was written in Bombay.

Coco-nut Pests in Samoa.

THE TRANSFER OF PESTS BY VISITING COOLIES.

MR. H. J. MOORS, recently writing in the *Samoa-nische Zeitung* on "Battling with Beetles on Coco-nut Trees in Samoa," says:—

"Concerning the mixture of tar and kerosene used by me on coco-nut trees to protect them from beetles, I believe tar alone would answer very well, quite as well, perhaps, as the mixture, but, as tar is thick and stiff to apply, the labour bill would be very considerable indeed, and it was chiefly to reduce this item that we mixed kerosene with our tar to thin it down, so that it could flow easily and quickly. Up to date we have not lost a tree that we have treated in the manner I have described.

"Many of the trees we have handled had already been seriously bored before we took them in hand. At this wet season it is hard to get natives to climb well-grown trees, and we are just now at a standstill, but as soon as we can do so we will recommence using our mixture. Since the wet weather has been so continually with us an attack of canker has broken out in Ululoloa, and we are fighting it. Unfortunately we did not carbide our trees before the wet weather began, and some of them were in a rather bare state. Amongst these, canker was discovered, and, up till now, about sixteen trees have been cut down, and some others are under treatment. Some of them we hope to save.

"The loss of trees on this property during the past four years from canker has now reached about 1 per cent. It is noticeable that this canker attack occurred right along the road to the coolie quarters, and it possibly might have been introduced by visiting coolies coming from an infected property, and carrying with them, in their clothes, the very light spores of the canker fungus. We have now almost succeeded in repainting all of our trees, notwithstanding the wet weather we have had. If any of them were infected by canker germs, before the wash was applied, the canker will quickly develop and show red spots against the white background of the wash. This is an advantage.

"In dealing with a cankered tree it is best to spray it or paint all of its affected parts with kerosene, or something else, before disturbing it, if it has to be destroyed; this to kill loose germs. Likewise, all of the affected bark should be sterilized before the knife is used, if there is to be an attempt to save the tree. No one knows for certain the best method of handling canker. We are very sure we do not, and we would be very glad indeed to learn from more experienced people.

"We would like to know how to clear out the fruit-fly from oranges. Wind belts are of very doubtful use so far as our experience goes."

Two interesting books on rubber cultivation have come in, but too late for review. One is by Dr. A. J. Ultée, on "Rubber, its Cultivation and Preparation," written in Dutch (H. D. Tjeenk, Willink and Zoon, Haarlem), and the other (in German, 93 pp., price Fl. 1.80), by Professor Dr. A. Zimmermann, on "Der Manihot-Kautschuch Ceará and the other Manihots," with a valuable bibliography of works on the subject (Gustav Fischer, Jena; 340 pp., many illustrations; price, Mks. 10).

Cotton.

THE following were the prices for Cotton in London on June 6th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1912.		Compare Good, 1911.		per lb.
	d.	d.	d.	d.	d.	d.		d.	d.	d.	d.	
Surat kinds*	5 $\frac{9}{16}$	to 5 $\frac{3}{4}$	5 $\frac{13}{16}$	to 6	6 $\frac{1}{16}$	to 6 $\frac{5}{16}$	—	5 $\frac{5}{8}$	to 5 $\frac{13}{16}$	7 $\frac{1}{4}$	to 7 $\frac{3}{8}$	—
Madras ...	5 $\frac{15}{16}$	to 6 $\frac{1}{16}$	5 $\frac{5}{16}$	to 6 $\frac{5}{16}$	—	—	—	5	to 6 $\frac{1}{16}$	6 $\frac{13}{16}$	to 7 $\frac{5}{8}$	—
Bengal ...	—	—	5 $\frac{5}{16}$	—	5 $\frac{9}{16}$	—	5 $\frac{11}{16}$	5 $\frac{1}{4}$	—	6 $\frac{9}{16}$	—	—
Assam ...	—	—	5 $\frac{9}{16}$	—	5 $\frac{15}{16}$	—	6 $\frac{1}{8}$	5 $\frac{5}{8}$	—	6 $\frac{3}{4}$	—	—
China ...	—	—	5 $\frac{3}{4}$	—	6	—	6 $\frac{1}{4}$	5 $\frac{7}{8}$	—	6 $\frac{1}{2}$	—	—
West Indian ...	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8 $\frac{1}{4}$	—	8 $\frac{1}{2}$	7 $\frac{3}{4}$	—	9	—	—
Sea Island ...	12 $\frac{1}{2}$	—	15	—	18 $\frac{1}{2}$	—	22	14	—	14	—	—
West African ...	5 $\frac{7}{8}$	—	6 $\frac{1}{2}$	—	6 $\frac{11}{16}$	—	—	6 $\frac{9}{16}$	—	8 $\frac{1}{4}$	—	—
East „ ...	6 $\frac{5}{8}$	—	7 $\frac{1}{2}$	—	9 $\frac{1}{4}$	—	—	7 $\frac{3}{8}$	—	8 $\frac{7}{8}$	—	—

* Liverpool quotations.

The feature of the week ending June 7th was the publication of the first Bureau Report, giving a condition up to May of 79.1, against 78.9 last year, and a ten years' average of 79.9. There has been a steady Trade demand, and old crop closes 1 lower and new 1 $\frac{1}{2}$ above last week's prices. East Indian is lower, and very little has been done. Bank Rate remains at 4 $\frac{1}{2}$ per cent., and Silver at 27 $\frac{11}{16}$ d. per oz.

The import into Liverpool this week amounts to 31,332 bales, since September 1st 4,277,055, same week last year 31,673, last year's total 4,813,673 bales. The estimated Sales amount to 56,000 bales, including "called." Middling American is quoted at 6.66d. per lb., last year 6.36d., 1911 8.33d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.
Brought into sight ...	13,226,000	15,349,000	11,491,000
Exports from United States since September 1st—			
To Great Britain ...	—	4,110,000	3,243,000
To Continent, &c. ...	—	5,435,000	3,813,000
Total crop ...	—	16,138,000	12,120,000

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	June 6th.	Same time 1912.	Same time 1911.
June ...	6.40	6.18 $\frac{1}{2}$	8.10 $\frac{1}{2}$ per lb.
June—July ...	6.34 $\frac{1}{2}$	6.18	8.0 $\frac{1}{2}$ —
July—Aug. ...	6.33	6.20	7.94 $\frac{1}{2}$ —

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

THE demand continues slow, and most descriptions sold in buyers' favour. At the close of the first week in June there was still less inquiry, and a large proportion was bought in, or where sold, a decline of 1s. to 2s. for the week has to be recorded. The stocks in the principal ports of Europe on June 1st show a decrease for the week of 153,000 bags, against a decrease of 195,000 bags last year; the visible supplies show a decrease for the week of 482,000 bags, against a decrease of 423,000 bags in 1912. "Futures" have been flat and lower owing to heavy receipts and lower foreign advices, and September Santos has been done down to 46s.; there has been a little recovery since, but the latest prices show a decline of 2s. 7 $\frac{1}{2}$ d. since the date of our last report. We quote :—

	To-day	May 29th, 1913
London ... Santos, Sept. del. ...	47s.	49s. 7 $\frac{1}{2}$ d.
New York ... No. 7 Rio „ ...	10.32 cents	10.92 cents
Hamburg ... Santos „ ...	52 $\frac{1}{4}$ pf.	55 $\frac{1}{2}$ pf.
Havre ... Santos „ ...	64 $\frac{3}{4}$ francs	68 $\frac{3}{4}$ francs

The receipts at Rio and Santos from July 1st, 1912, to June 4th, 1913, were 11,012,000 bags, against 12,071,000 bags, and 10,236,000 bags in the two previous seasons respectively.

Sales include the following, viz. :—

East India.—1,100 bags, viz.: Mysore, 67s. to 68s. for smalls, 72s. to 73s. for middling, 76s. to 79s. 6d. for bold. Neilgherry, &c., 68s. 6d. to 74s. for smalls, 73s. 6d. to 79s. for medium, 76s. 6d. to 83s. for bold. Naidoobatum, 68s. 6d. for smalls, 74s. to 77s. for medium, 81s. for bold.

Nairobi.—165 bags, at 71s. 6d. for smalls, 75s. 6d. to 77s. 6d. for good middling, bold 76s. 6d. to 82s. 6d.

Sumatra.—86 bags, at 78s. for Liberian.

Costa Rica.—2,000 bags, at 72s. 6d. to 74s. 6d. for smalls, 63s. to 68s. for ordinary to fine ordinary, 68s. 6d. to 79s. 6d. for fine fine ordinary to good middling, 75s. to 83s. for bold.

Guatemala.—1,000 bags, at 68s. to 74s. 6d. for fine fine ordinary to good middling, 73s. to 78s. 6d. for bold, 85s. for Maragogipe.

Salvador.—470 bags, at 70s. to 73s. 6d. for low middling to good middling, 73s. to 77s. 6d. for middling to good middling bold.

Nicaragua.—380 bags, at 55s. 6d. to 59s. for ordinary to fine ordinary foxy green, 70s. 6d. for smalls, 76s. for good middling, 80s. 6d. to 87s. for bold.

Vera Paz.—510 bags, at 65s. 6d. to 72s. 6d. for smalls, 78s. 6d. to 85s. for bold, 103s. 6d. to 104s. for Maragogipe.

Mexican.—620 bags, at 64s. to 65s. for smalls, 71s. to 74s. 6d. for middling to good middling, 71s. to 80s. 6d. for bold.

Colombian.—63 bags, at 70s. 6d. to 72s. per cwt.

Sugar.

WRITING on June 5th, Mr. C. Czarnikow reports that after last week's rain Germany had again some days of summer heat (up to 30° C.), with local storms, which, however, though favouring many districts, are not general, and the sugar market had again a temporary attack of the drought scare, which moved prices of August from 9s. 6½d. to 9s. 8¼d. to 9s. 6¾d., next crop from 9s. 8d. to 9s. 10¼d. to 9s. 9d. At the same time the number of active Cuban factories decreased from 104 to 62, and the weekly receipts were according to Guma 62,000 tons, Himely 68,000 tons, last week Guma 69,000 tons, Himely 61,500 tons, and in support of what we have repeatedly pointed out, Mr. Himely writes on May 19th: "Receipts are moderate this week, but if the large centrals Preston and Boston (no shipments) and Manzanillo (8,000 bags) had exported an average amount, receipts would easily have been increased by 12,000 tons. We are liable to have some surprises when Cienfuegos and Sagua, whose plantations are heavily stocked with sugar, ship it for export. Matanzas and Cardenas centrals also have a good deal of sugar at the mills." Though May receipts do not come up to expectations, it is probable that receipts in June/October may be slightly more than last year.

In New York the quotation improved from 3.33 to 3.36 cents, equal to 9s. 3d. c.i.f. United States, or 9s. 9d. c.i.f. United Kingdom, though Porto Ricos are still selling fractionally easier. There is no doubt that the uncertainty of sugar legislation prevents an expansion of trade, and though melt-ings of 50,000 tons are now required for barest wants, these compare with 59,000 tons last year. Only small sales to European buyers are reported in Cuba this week, and there is probably not much room for many more in United Kingdom; besides, Cuba should be able soon to hold her own.

The total transactions in British West India for the week ending June 6th amount to about 11,000 bags, and included Crystallized Demerara, good dry pale small grain at 15s. 6d. duty paid. Crystallized Trinidad, good yellow, 15s. 3d.; good pale, 15s. 6d.; fine pale, 16s. to 16s. 3d. Crystallized St. Lucia, good greyish, 15s.; middling yellow, 15s. 3d. to 15s. 6d.; good palish yellow, 15s. 6d.; Syrups, soft heavy yellowish, 10s.; strong heavy grey, 10s. 6d. to 10s. 9d. Crystallized Jamaica, good middling yellow, 15s. 3d.; Muscovado, good grocery, 15s. 6d. to 15s. 9d.

2,014 bags low brownish Guatemala Crystallized sold at 14s. to 14s. 3d. duty paid, also 529 bags low middling brownish yellow Syrups at 13s. 9d., and 349 pockets middling soft greyish yellow ditto at 14s. 6d.

In the United Kingdom transactions in Cane Sugar are still restricted by the lack of supplies, apart from Cuban Centrifugals, which are now not obtainable under 9s. 9d. c.i.f. Grocery Crystallized has been steadier in tone, and a moderate business was done at about previous rates. Low brown sugars are only offered very sparingly. From cane-producing countries there is nothing of special interest.

Up at Liverpool about 300 tons grainy sold at 10s. 0½d. floating, landing, Clyde, and 10s. 4½d. quay Liverpool, basis 96 per cent. polarization, and about 1,000 tons of Syrups at 8s. 4½d. floating, landing,

Greenock, basis 89 per cent. polarization. Another 1,250 bags of Syrups changed hands at 9s. to 9s. 1½d. quay telquel.

Coco-nut Products, &c.

MID-MAY, it will be remembered, report Messrs. Mordaunt Bros., saw coco-nut oil firm, but with little doing, and prices up 5s. to 10s. a ton, with Cochin at 45s. and Ceylon at 42s. 6d. to 43s. 9d. The latter remained unchanged for a week, whilst Cochin advanced to 46s. 6d. (nominal, nothing being offered). By June 7th a large business had been done in Ceylon oil at 42s. 3d. to 43s. c.i.f., according to position, but Cochin was very scarce and held for 46s. 9d. to 47s. c.i.f. terms. Pressed oil for early delivery was being inquired for, but was only obtainable for September-December delivery at 40s. 3d. f.o.b. Palm kernel oil was well held at 41s. 9d. to 42s. 6d. f.o.b. Hamburg. Prices generally, on June 7th, ran as follows:—

<i>Palm oil (Liverpool):</i>		1913	1912	1911
Per cwt.				
Lagos	... 31s. 6d. to 31s. 9d.	28s. to 28s. 6d.	28s. to 29s.	
Benin	... 29s. to 29s. 3d.	27s. 3d. to 27s. 6d.	27s. 6d. to 28s.	
Congo	... 26s. 6d.	26s. 6d.	25s. to 25s. 6d.	
Bleached	... 32s. 9d. to 34s.	31s.	31s. 6d. to 32s.	
Clarified	... 29s. to 30s.	27s. 6d. to 28s.	28s. 6d. to 29s. 6d.	
<i>Palm kernel oil</i>		41s. 9d. to 43s. 6d.	35s. 3d. to 35s. 6d.	34s. to 36s.
<i>Coco-nut oil:</i>				
Cochin	... 52s.	43s.	40s.	
Ceylon	... 45s.	41s. to 41s. 6d.	37s. 6d.	
English pressed	None	35s. 9d. to 36s. 6d.	35s.	
<i>Copra oil:</i>				
Ceylon	... None	38s. 6d. to 39s.	36s.	
Cochin	... 50s. 6d.	41s. 3d. to 42s.	38s.	

According to the *Public Ledger* of June 13th, prices ruled as under (per ton):—

Soya Oil.—Hull, Naked Extracted spot and to December, £25 10s. Oriental (in cases) afloat quoted £23 2s. 6d. c.i.f.; March-April, £23 2s. 6d. c.i.f.; April-May, £23 2s. 6d. c.i.f.; May-June, £23 10s. c.i.f.; June-July, £23 12s. 6d. c.i.f.; July-August, £23 15s. c.i.f. Antwerp.

Linseed Cakes.—London-made, £7 12s. 6d. to £7 15s.

Cotton Cakes.—London-made, £5 16s. 3d. to £5 17s. 6d.

Copra firmer. Manila, March-May, £28 10s. sellers; April-June, £28 2s. 6d. buyers; and July-September, £27 7s. 6d. buyers. Cebu, May-June, £28 10s. buyers. Java, March-May, £29 2s. 6d. buyers; April-June, £28 17s. 6d., and July-September, £28 5s. Northern Ports net. South Sea Islands, June-July, £28 5s. buyers; Continent, June-July, £28 5s. buyers London. Malabar, May-June, £31 7s. 6d. sellers. Ceylon, April-June, £30 5s. sellers Northern Ports. F.M.S. Straits, May-June, £29 paid Northern Ports; F.M. ditto, May-June, £28 15s. sellers; mixed no Padang, April-June, £28 paid. Macassar, May-June, £28 17s. 6d. sellers c.f. and i., delivered weight.

Soya Oil Beans.—Parcels Harbin spot Hull, £8 5s.; June-July, £8 10s.; July-August, £8 10s.; October-November, £8 8s. 9d. Hull.

Coco-nut Oil firmer. Ceylon spot, £45; April-May, £44 5s. c.i.f.; May-June, £43 10s. c.i.f. Cochin spot, £52; May-June, £46 c.i.f.

Palm Oil.—Lagos on spot, £34.

Palm Kernel Oil.—June, £42 15s.; July-December £41 10s. f.o.b. Hamburg.

Messrs. Goodlake and Nutter, reporting on coco-nut oil, state that Ceylon Oil is very firm, and there has been considerably more inquiry for forward positions. There has been a large business done in July-September at 42s. 10½d. to 43s. 1½d., sellers wanting 43s. 3d.; June-July, 43s. 6d.; May-June, 44s. Cochin Oil very inactive, and we quote 46s. April-June. Palm Kernel Oil is also much firmer, and 42s. 6d. has been paid for June f.o.b. Hamburg, with further buyers at the price, sellers asking 43s. July we quote 42s. 6d., and after 41s. paid for September-December sellers are asking 41s. 6d. Pressed Oil is firm, but there is nothing offering for near positions. September-December we quote 41s. in Ceylon casks f.a.s. London. Spot prices: Ceylon, £45 10s. to £47 10s.; Cochin, £48 to £51.

The India-rubber Market.

FINE HARD AT 3S. 9D. PER LB., AGAINST 3S. 1D. TO 3S. 3½D., TOP PRICES FOR EASTERN PLANTATION.

Up at Liverpool the Pará market has been quiet but steady. Sales included uncut Bolivian fine 3s. 7½d. spot, and Peruvian fine spot 3s. 8d.; June-July ordinary hard cure fine, 3s. 8½d. to 3s. 8¼d.; July-August, 3s. 7½d. to 3s. 7d.; August-September, 3s. 6½d. to 3s. 6d.; and September-October, 3s. 5d.; ball, 2s. 5d. to 2s. 4d.; and scrappy negroheads, 2s. 4d. per lb. Medium Brazilian grades continue to be quiet, although a little more inquiry has been experienced. The African market has been dull, with only a retail business passing, including Gold and/or Ivory Coast lump rejections, 1s. 5½d.; ditto thirds, 1s. 5d.; Accra paste, 10d. to 11d.; Rio Nunez niggers, 3s. to 3s. 0½d.; Conakry sheets and strings, 2s. 10½d.; Conakry niggers, 2s. 8½d.; red Assinee niggers, 3s. to 3s. 1d.; and medium to small Lahou cake, 2s. 2½d. to 2s. 2d. per lb.

The London auctions during the first week in June included 1,045 tons of Eastern Plantation, and lasted for four days. The feature of the sales was the low price paid for Plantation rubber compared with Fine Hard, Messrs. S. Figgis and Son giving prices as under. It will be noted that Malayan rubber cured by the "Byrne" process sold the highest.

The forward market is lower except for Fine Hard Pará, and in these auctions 1,045 tons Eastern Plantation rubber were offered and sold at a decline of 2d. to 2½d. per lb. on the closing prices of the previous sales, except for brown and inferior Crêpes, which were 4d. to 6d. per lb. lower. Latex Crêpe is now 3s. 1¼d., Hard Fine Pará 3s. 9d., Soft Fine Pará 3s. 6½d., and Caucho Ball 2s. 4½d.

Prices realized ruled as follows:—

Malaya.—Crêpe; fair to fine pale, dull to good palish (one lot 3s. 2¼d.), 3s. 1d. to 3s. 2d.; light brown and grey, part streaky, 2s. 10½d. to 3s. 1¼d.; fair to good clean brown, 2s. 7d. to 3s. 0½d.; dark and specky brown, 2s. 2¾d. to 2s. 9½d.; dark and black, part pressed, 2s. to 2s. 7d.; dark and black, inferior, 1s. 7½d. to 1s. 11½d.; dark to good smoked, 2s. 5¼d. to 2s. 11½d.; cured by "Byrne" process, 2s. 7½d. to 3s. 3¼d. Sheets, fair to very fine smoked (Highlands, 3s. 3½d. to 3s. 4d.), 3s. 1½d. to 3s. 3¼d.; damp, mouldy, and part smoked, 2s. 9d. to 3s. 1½d.; fair to fine un-

smoked, 3s. 1d. to 3s. 2d.; damp, mouldy, and stuck, 2s. 9d. to 3s. 0½d. Block, Fine pale Lanadron, 3s. 1¼d. to 3s. 2d. Scrap and Virgin, fair to good, 2s. 3d. to 2s. 4d.; mixed and inferior, 1s. 6d. to 2s. 1d. Rambong—Crêpe, 2s. 5d. to 2s. 7d.; scrap and block, 2s. 5d. to 2s. 7d. Castilloa—sheet, 2s. 6d.

Ceylon.—Crêpe, thick dull to fine (very fine, 3s. 3d. to 3s. 3½d.), 3s. 1d. to 3s. 2¾d.; fair to fine pale, dull to good palish, 3s. 1d. to 3s. 1¾d.; light brown and grey, part streaky, 2s. 10½d. to 3s. 1d.; fair to good clean brown, 2s. 7d. to 3s.; dark and specky brown, 2s. 3d. to 2s. 9d.; dark and black, part pressed, 2s. 1d. to 2s. 7d.; dark to good smoked, 2s. 6d. to 2s. 10d. Sheets, fair to good smoked, 3s. 1½d. to 3s. 2d. Sheets and Biscuits, fair to good unsmoked, 3s. 1d. to 3s. 2¼d.; damp, mouldy, and stuck, 2s. 10d. to 3s. 1d. Scrap and Cuttings, fair to fine, 2s. 2¾d. to 2s. 4d.; mixed and inferior, 1s. to 2s. 1d.

Manihot.—Thick brown Crêpe, 2s. 8d.; Lewa Ball, 1s. 11d.

Later news (June 13th) from other sources states that Hard Fine on the spot closes 3s. 9¾d. value; June delivery, 3s. 9¾d.; June-July, 3s. 9¼d.; July-August sold at 3s. 8¼d. and value; August-September, 3s. 7¼d. value; and September-October, 3s. 6¼d. Soft Fine nominal; June-July and July-August delivery quoted 3s. 6½d. value. Negroheads dull. Manaos scrappy, June-July and July-August delivery, 2s. 3d. value. Caucho Ball dull; June-July delivery, 2s. 3½d. value; July-August, 2s. 4d.; and August-September, 2s. 4½d. Plantation is dull and easier, with a moderate business doing in Standard Quality No. 1 Crêpe, spot at 3s. 0¾d. to 3s. 0½d. and value; June delivery, 3s. 0½d. value; June-December, 3s. 0¾d. value; July-September sold at 3s. 0½d. and sellers; July-December, at 3s. and value; ditto open option, at 3s.; October-December, 3s. 0¼d. sellers; January-June (1914) sold at 2s. 11½d. and sellers. Smoked sheet (ribbed) spot closes 3s. 1d. value; June delivery sold at 3s. 1d. and value; June-August, 3s. 1d.; June-December, 3s. 0¾d.; July-September, 3s. 1d.; July-December, 3s. 0¾d.; October-December, 3s. 0¾d.; and January-June (1914), 3s.

Pará rubber statistics for the month of May (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará	...	1,800	1,080 = 2,880	agst. 3,410	3,060	2,150
Shipments to Europe		1,080	640 = 1,720	„ 1,130	1,720	1,370

Crop statistics, June 30th, 1912, to May 31st, 1913 (11 months):—

	Pará.	Caucho.	1912-13.	1911-12.	1910-11.	1909-10.	1908-9.
Pará {	1912-13	31,010	8,840	39,850	36,790	35,780	37,930
Receipts {	1911-12	30,460	6,330				36,520
„ Shipts. Europe	16,460	6,270	22,730	18,390	18,590	20,620	18,240
„ „ America	15,740	2,980	18,720	19,400	12,650	16,560	18,130

THERE was an almost unprecedented period of drought in many parts of the island of Porto Rico, which in some centres began in 1911 and continued, with but few exceptions, up to August last year, when a meeting was held to discuss the possibility and practicability of installing cheap but efficient irrigation plants that would assist in the future to diminish the disastrous effects of droughts. The proceedings of this important meeting has been published by the Experiment Station of the Porto Rico Sugar Producers' Association, Rio Piedras, P.R., and is well worth studying.

The London Cocoa Market.

By THE EDITOR.

TAKING the Havre movements first, that centre, I see, reduced its stock nearly 6,000 bags during May (200,070 bags, against 205,866 at end of April), and the figures are just 100,156 bags less than they were two years ago (300,226 bags on May 31st, 1911). Comparative stocks at the end of last month stood as under:—

	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
<i>Havre Stock, May 31st—</i>				
Pará ...	14,456	80 to 85	7,191	77 to 79
Bahia ...	12,429	82 „ 87	10,809	70 „ 75
Venezuela ...	42,206	85 „ 180	45,199	73 „ 200
Trinidad ...	23,752	85 „ 89	37,265	78 „ 81
Grenada and O.W.I.	4,230	79 „ 87	5,442	66 „ 74
San Thomé ...	7,041	86 „ 89	7,336	70 „ 72
San Domingo ...	4,970	73 „ 78	7,989	63 „ 69
Haiti ...	6,817	68 „ 82	13,070	57 „ 71
Accra ...	56,037	76 „ 80	66,646	65 „ 67
Guayaquil... ..	17,591	88 „ 95	14,880	74 „ 83
Divers ...	10,541	—	7,116	—
Totals ...	200,070 bags		222,943 bags	

Compare this with the London stock on June 7th as compared with May 3rd (87,044 bags):—

	1913. Bags.	1912. Bags.
<i>London Stock, June 7th—</i>		
Trinidads ...	8,395	7,852
Grenadas ...	7,734	5,851
Other W.I. ...	3,256	7,769
British Africa ...	10,442	10,194
Portuguese Africa...	5,702	4,328
German Africa ...	4,829	7,082
Ceylon and Java ...	22,396	16,896
Guayaquil ...	11,552	44,348
Brazil and Bahia ...	296	2,584
Other Foreign ...	7,328	7,218
Totals ...	81,930	114,122

It may be remembered that during the whole of June last year the landings in London were “nil,” or practically so, on account of the dock strike. The stocks given for 1912 should, therefore, have been even larger in comparison to this year.

With 66,500 bags Accra kinds between London and Havre, there should be an ample supply of this growth to draw upon, as well as a substantial quantity to come forward from the Coast, where the exports to the end of March were 40 per cent. more than last year, say:—

	1913.	1912.
January ...	17,657,708	14,682,962 lb.
February ...	15,946,449	10,740,557 „
March ...	9,054,427	4,997,993 „
Totals ...	42,658,584	30,421,512 „

This increase will be most welcome, as reports from elsewhere are anything but satisfactory. The Trinidad crop seems done for altogether, and all that is left is to see what prospects we can expect after the hot weather and drying winds that again set in. Bahia seems in the same plight, as the continued drought there is doing harm to immediate outputs, and laying up trouble for the future. Her January-March receipts were less than half those of 1911, and a good deal behind last year's, say 85,716 bags, against 115,410 last year, and 172,759 in 1911.

Leaving the Gold Coast, and crossing to San Thomé, we see that, unlike the Lisbon movements in May when receipts were about a third of the deliveries, in

May, according to Messrs Martin, Weinstein and Co., it was rather the other way round, say:—

	Bags.
Lisbon stock, April 30th ...	33,730
Landed in May ...	36,758
Total ...	70,488
Delivered in May ...	11,833
Leaves stock on May 31st, 1913 ...	58,655
Against „ „ 1912 ...	90,097

Meanwhile it has generally been agreed that, with cocoa above 56s. for so long, makers must have been drawing heavily on their stocks during the last twelve months, as they do not buy to “lay up” when prices continue so high as they have done. This, with the disappointing output at producing centres, has caused a stiffening in prices, so that values are, as with Grenadas, some 5s. to 6s. higher than those quoted a month ago.

Coming to the Board of Trade figures for the United Kingdom, these show a continued and much augmented increase in the imports of foreign manufactured, which increase promises to continue, the English makers having taken too long to follow my advice and place a good quality cocoa essence on the market to compete with that which now comes in so freely from the leading Dutch makers since the import duty has been amended. With all good feelings to our excellent friends in Holland, we do think that it is a pity that the makers of this country, whose colonies and dependencies turn out so much raw cocoa, should have charged its inhabitants such a high price for so long as to enable the comparative trade figures to stand as follows. Our makers, like others since the world began, may not believe in one kind of home-made “prophet” who warns them of evils to come, but they certainly have believed in another sort of home-made “profit,” and to such a degree that they have brought all this trouble about their heels.

The Board of Trade returns for the United Kingdom for the five months, January-May, show that the foreign manufactured has increased 935 tons, against only 686 tons of raw cacao for home consumption by the English makers. I will give the figures rather more in detail than usual:—

<i>Raw Cocoa only—</i>	Landed.	Del'd H.C.	Exported.	Stock (May 31st)
May only, 1911—	2,836	3,171	563	15,893 tons
„ „ 1912—	2,187	2,584	514	12,115 „
„ „ 1913—	2,795	2,981	530	11,429 „
Five months.				
Jan.-May, 1911—	18,565	9,671	2,549 tons	
„ „ 1912—	17,098	11,761	2,743 „	
„ „ 1913—	17,822	12,447	3,326 „	
Incr.	724	Incr. 686	Incr. 583	

<i>Foreign Manufactured—</i>	Landed.	Del'd H.C.	Landed.	Jan.-May.	Del'd H.C.
May only.					
1913—	1,150	1,054	5,063	...	4,910 tons
1912—	645	587	3,786	...	3,981 „
1911—	683	616	3,135	...	2,840 „

Going off the subject for a moment, I see by *The Wealth of India* that, according to a German scientist, if cocoa is made of soft water, a pleasant and rich drink is obtained which, after a short boiling, deposits the powder. Even if the cocoa is made into a paste with a little water and the cup then filled with hot

water, the largest part of the powder will precipitate, and the beverage will still be rich and pleasant. If, however, hard water is used flakes will at once appear, and the oil in the cocoa will be seen floating on the surface of the drink. The flakes will soon settle, and the beverage is far less tasty than the one obtained with soft water. In the preparation of tea the hard water causes the formation of a thin film. Hard water is equally bad for coffee making, as in this case also it cannot extract all the virtues from the raw material.

Although the very latest news from Trinidad speaks of some showers, the planters in that island have had a bad time again with hot dry weather, which promises to check their chances of any substantial pickings until the end of the year; and although the total shipments since October 1st do not show so badly, it must be remembered that the number of estates and the area planted steadily increases, and instead of being 34,000 bags behind the 1909/10 crop (173,000 bags, against 207,000 bags in 1909/10), this season's output ought to be at least 34,000, and even 43,000 bags more, and these 70,000 or 77,000 bags would have made all the difference just now. Bahia planters are also, I understand, asking higher prices for their cacao, as the severe drought has affected their output and restricted receipts.

All this has caused the market to advance 1s. to 2s. a week, until June 17th found prices as follows:—

Trinidads.—Good to fine red sold at 75s. to 78s.; superior being valued at 78s. to 80s.

Grenadas.—Fine has been selling at 73s., and even 73s. 6d. for picked lots; good red at 71s. 6d. to 72s.; whilst common unfermented to fair fermented last sold at 67s. to 70s., against 66s. 6d. to 68s. 6d. on June 3rd.

Dominicas.—Good red realized 69s. to 70s.; finer up to 71s. 6d.; fair reddish sold at 68s.

Jamaicas.—Good to fine sold on June 3rd, 69s. to 72s.; common unfermented to fair fermented at 62s. 6d. to 67s.

St. Lucia.—Fine marks sold at the beginning of June at 71s. 6d. to 72s.; fair to good reddish at 67s. 6d. to 70s. 6d.

St. Vincent.—A lot of fiery red realized 83s. 6d.; fine paler fiery, 78s. to 79s.

British Honduras.—Good pale reddish sold at 70s.

British West African sold in London at 62s. to 65s. 6d., and up at Liverpool at 58s. to 63s.

East African.—Medium realized 70s., and good boldish 75s.

Costa Rica.—Good reddish sold at 71s., and bolder at 74s.; that was on June 3rd. On June 10th, good reddish sold at 72s. 6d. and fine at 74s. 6d.

Venezuelan.—Good ordinary unclayed, 86s.; good bold, 95s.

Samoa.—Fair boldish, 75s. to 78s. 6d.; good bold, 85s.

Java.—Good bold sold at 83s. to 87s.

Guayaquil.—Ordinary to good Machala is selling at 72s. to 75s.; good to fine Caraquez at 75s. to 78s.; and later summer Arriba at 80s. and 81s.

Bahia is valued at 69s. to 73s.

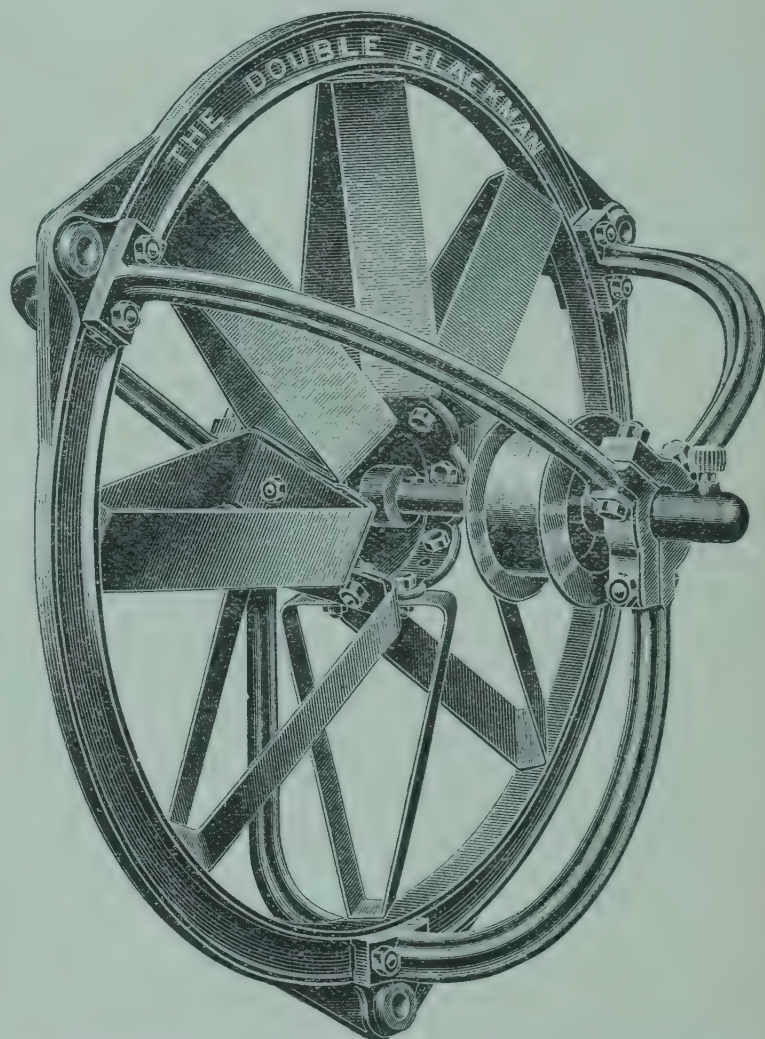
Cameroons and St. Thomé are worth about 70s. to 72s.

Ceylon.—Good bold is selling at 82s. to 85s.; fine bright up to 90s. 6d.; good medium at 81s. to 81s. 6d.; small reddish at 78s.; Native, middling to fine, 60s. to 77s.

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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. IX.—No. 7.]

JULY, 1913.

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Our Book on "The Fermentation of Cacao."

FINAL proofs of the above book have been passed and printed off, the synopsis is complete and the indexing has been started. There are 294 pages, exclusive of the Preface by the Editor, and the Foreword by Sir George Watt. As already stated the price will be the same as that of our two previous works, *i.e.*, 10s. net, or 11s. post free. Essays by the following authorities have been included:—

(1) Dr. Axel Preyer, Berlin; first published 1901.

(2) Dr. Oscar Loew, Munich, formerly of Tokyo and Porto Rico. With some comparative notes on the fermentation of tea and coffee; first published in 1907.

(3) Dr. Fickendey, Cameroons, German West Africa; first published in 1909.

(4) Dr. Schulte im Hofe, Berlin. With some comparative notes on the fermentation of indigo, tea, coffee, and tobacco.

(5) Dr. J. Sack, Holland and Surinam.

The Joint Essay that won the £50 prize offered by TROPICAL LIFE, and written by:—

(6) Mr. Geo. S. Hudson, St. Lucia, B.W.I.

(7) Dr. Lucius Nicholls, of Cambridge and (at the time) St. Lucia, B.W.I.

(8) "The Last Word." Being notes written this year, by the various authors, so as to bring their views up to date.

(9) Some comparative notes on tobacco fermentation by the Editor, Mr. Harold Hamel Smith, who also contributes in the Introduction some notes on the necessity of standardizing exports, on the possibility of making vinegar from the cacao-juice for human consumption, or denatured alcohol for motive power, &c., and on the need of the various Governments assisting planters to choose the best machinery, &c., by testing them first, and so enabling both the makers who sell the machines, and the planters who buy them, to see exactly how far they are able to do in the Tropics all that is claimed for them at home in the factory. There is no doubt that the book when complete will supply a long-felt want, and fill up a, at present, wide gap that hitherto tended to prevent further investigations in the subject.

THE last paragraph on p. 115 in our June issue did not read as plainly as we should like it to have done. "Rubber, its Cultivation and Preparation" is printed in Dutch. It covers 93 pp., and costs Fl. 1.80, the author being Dr. A. J. Ultée, and the publishers Messrs. H. D. Tjeenk, Willink and Zoon, at Haarlem. Professor Zimmermann's book on the Manihot rubbers costs Mks. 10, extends to 340 pp., with a large number of useful and interesting illustrations, and is published, in German, by Mr. Gustav Fischer at Jena.

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Funtumia Rubber and its Yield.

(Continued from p. 7.)

PART IV.—TAPPING AND TAPPING IMPLEMENTS.

FROM time to time we have been hearing rumours and reports of new methods of tapping *Funtumia* rubber trees; sometimes Dr. Christy's name* has been coupled with the reports, and sometimes other authorities are mentioned. The latest accounts speak, however, of a new system of tapping *Funtumia* trees, initiated by Dr. Christy, by means of a series of small borers set in a circle. This method, it is expected, will double the output. By the old vertical incision system, 31 lb. of rubber were said to have been obtained to the acre from seven-year-old trees in the Congo, whilst by the new method as high a return as 97 lb. is looked for. This description of the process sounds like a series of rotating spindles as used to stop teeth, or to perforate a large number of holes in the backs of brushes at the same time. Again, we remember hearing of a number of sharp tubes, about the diameter of an ordinary lead pencil, which were driven into the bark and then the latex was to be withdrawn by suction. What will be the end of these patents, or want-to-be patents, we cannot say. Whilst we feel certain that any day a method of using electrically-propelled tapping knives or implements may be announced that will solve the difficulty of securing a speedy, cheap, and sure method of tapping all rubber trees, we are equally sure that such a tool will consist of rapidly turning disc blade cutters of small diameter, which the man will apply to the fixed tree and cause to cut it as desired, in the same way as men apply a cutting tool to the revolving wood, ivory, or what not, that they have to shape whilst revolving on a lathe. The system is reversed, that is all: on the lathe that which is to be carved rotates, and the cutting tool remains still; with a rotating disc, the tapping knife rotates, and the wood to be cut does not move. Instinct, as with carving, tells the man how deep to go, here deeper than there, and no one who has seen carving done on a lathe, often turned by the foot, can doubt but what the same system can be applied to tapping a rubber tree, no matter how uneven its bark may be. Such a method could do for incision only or to excise and shave the bark, but not for making holes.

Holes and perforations are always bad: if close together they rot the bark; where too deep the wound never heals properly; and at all times they are liable to leave the surface warty and uneven, and seem to cry out to insect and other pests to come inside and take up their abode there, to the permanent detriment of the tree. Besides all this, except for Ceará perhaps, perforations do not afford suitable means for obtaining the latex, especially in *Funtumia*, as the cells must be ruptured by transverse cuts to yield properly, since they run longitudinally and not across, so that punctures would have to be so close together that serious harm would be done to the tapping area all over the tree. If our readers will refer to the blocks from our book on "The African Rubber Industry,"* which we reproduced on p. 7 of our January issue, it can be seen

by fig. A that the cells go up and down the bark in fairly even longitudinal groups. This can be more plainly seen in fig. B. Therefore, it is easy to realize that if we want to get the utmost yield, cuts must be made across the channels on the spiral or herring-bone system; longitudinal cuts or stabs will not suffice. With *Funtumia*, the initial laticiferous cells, eight in number, are present in the embryo; they grow and branch repeatedly, increasing in length with the growth of the plant. No new cells are formed, and very little anastomosis occurs between the ever-increasing number of branches, resulting in bundles of tubes extending for long distances in a more or less vertical direction and parallel, that is in a manner very different to *Hevea* with its network of vessels. The walls of these tubes (*Funtumia*) in adult tissues, Dr. Christy tells us, are so thin as to be hardly demonstrable, but in seedlings they are quite obvious.

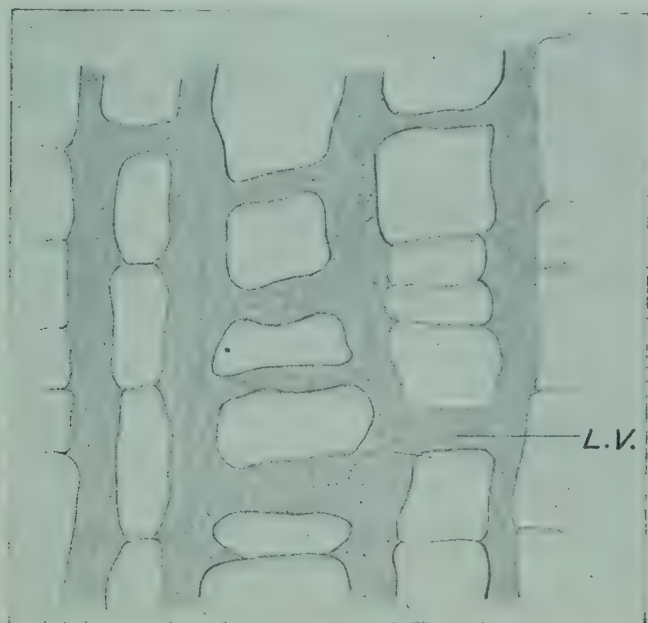
Since the latex cells or tubes in *Funtumia*, therefore, run as described, a good knife for tapping the tree would be, to our mind, one made on the principle of the "Wickham," manufactured by Messrs. David Bridge and Co., Ltd. This implement consists of three or more cutting blades half an inch wide (that is the same width as the seringuero's machadine in the Amazon Valley), which are kept hidden inside a shield on account of spiral springs. The implement is placed against the tree and struck firmly and sharply on the back, with the result that the three half-inch cutting blades dart out and into the bark, to be instantly withdrawn owing to the springs. According to the thickness of bark to be dealt with immediately under the knife's surface, so would be the strength of the blow; for a thick bark it would be a heavier one, and the cuts could be given here and there as desired with great rapidity. For the purpose of conveying the latex to the ground a half herring-bone system of tapping, with side cuts 18 or 24 in. apart, could be made on the tree, and the "stabbing" just described placed between the transverse cuts, which would catch the latex and convey it down the sides to the central groove and thence to the cup. As *Funtumia* "milks" freely when tapped two or three times only a year, it would be as well not to make all the "stabs" at once between the same two lines, but to do, say, three cuts (each making three stabs) here and three there, and three more farther down below the next transverse cut. By the time these have had their first drain-off, and the latex run down the tree, the tapper could return to near by the first and start again. Otherwise, given a space 18 x 18 in. square, with six or more stabs on it, the latex might overflow the side cuts and be spoiled or lost.

Mr. W. M. Selwyn, who often favours us with a visit to discuss rubber planting and tapping in various parts of the world, for he seems to have been everywhere, contributed an article on "*Funtumia*" to the *India-Rubber Journal* (February 8, 1913, p. 19 *et seq.*) that everyone interested in this tree should study. We therefore asked his advice on the idea of a perforating tapping tool, but he voted against it, as forming holes that do not heal well, that let in insects, and which, above all, do not get at the latex. As the latex cells run in a vertical direction, he maintains that a horizontal, *i.e.*, a cross slit, will always be preferable to a round hole. In addition to tapping a

* Author of "The African Rubber Industry." TROPICAL LIFE Publishing Department. Price 13s. 6d. post free.

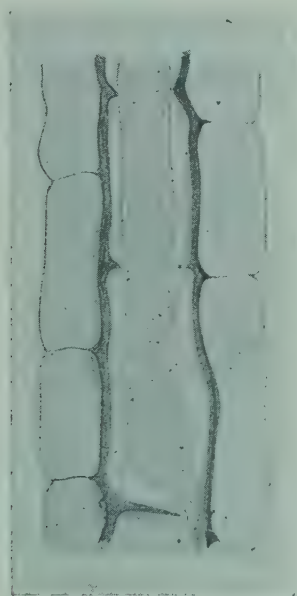
few latex cells by the bores, a large amount of bark is removed, requiring a considerable time to heal, and offering meanwhile danger spots for insects, especially as the latex being very thin, and not coagulating spontaneously, the tree cannot protect itself against them. In view of the varying thickness of the bark on one and the same tree, no guard, that would allow of quick and effective tapping, could offer an adequate safeguard against injury to the cambium and wood. To obtain latex with the minimum injury to the tree

the bark and the free run of the latex, there is always considerable difficulty in avoiding loss of latex even with vertical cuts; for this reason, Mr. Selwyn votes against any system of tapping by means of a number of independent holes, even when clay collecting rings are made round the base, as is sometimes done with Ceará. The Funtumia being a forest tree with long



HEVEA BRASILIENSIS.

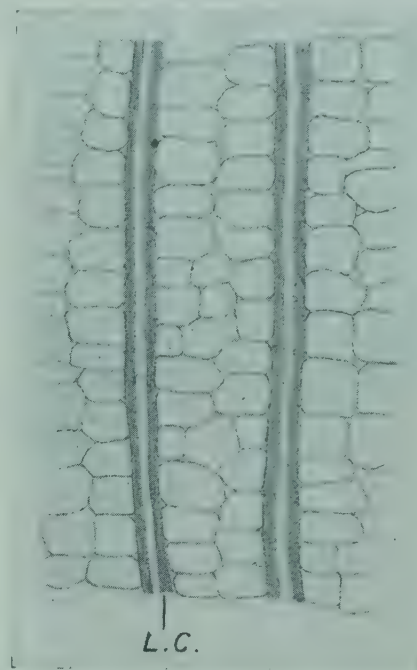
Longitudinal section. Showing anastomosing laticiferous vessels. (L.V.).



HEVEA BRASILIENSIS.

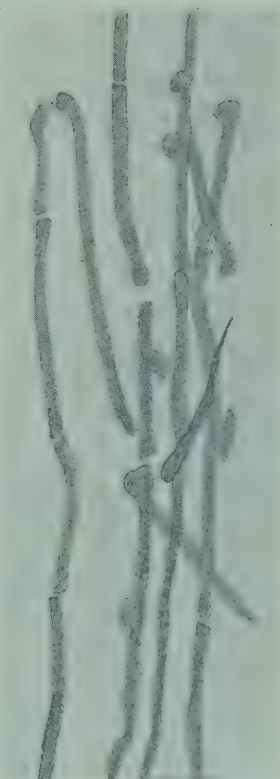
Showing a vessel in the process of formation by the breaking down of walls between originally separate cells (after Dr. D. H. Scott).

is simply a matter of skill, *i.e.*, an intuitive regulation of the pressure on the cutting blade with Hevea, or of the force of the blow with the stabbing tool with Ceará. With a boring appliance, that practised touch which is the characteristic of an experienced tapper would be lacking, and hence there would be more danger of damaging the cambium. As the bark of the Funtumia when tapped as it must be, only three or four times a year, yields very freely, a cut drains a comparatively large area, so that they need not necessarily, when using the herring-bone system, be placed close together. On account of the thinness of



FUNTUMIA ELASTICA.

Longitudinal section. Showing the parallel course of the laticiferous cells (L.C.) without anastomosis.



FUNTUMIA ELASTICA.

The rubber contents of the laticiferous cells remaining after maceration of the tissues (after Miss Winifred Smith).

intervals between the tapping, thereby necessitating fresh clay rings each time, such a scheme, even if possible, would be too costly. The small and irregular yield of Funtumia, given at long intervals, and its scattered location in the forest, do not warrant the employment of a better class of labour than that which is current among the African natives, and the appliances they are capable of using must be supplied to them, for they are not able at first to use any other. The

methods at present in vogue include a piece of hoop-iron bent back on the principle of a V-knife or the farrier's blade, and then cleverly sharpened with a file. Like the Eastern coolie who shaves his compatriot with a piece of broken glass, or the West Indian servant girl who insists on squatting on the ground and eating her pillau or salt fish with her fingers out of one condensed milk-tin and the rice out of another, even when a table, plates, and knives and forks are handy, so does the African *chez lui* apparently prefer his home-made primitive implement, or a still commoner German imitation, to any decent tool that the owner offers to provide him with. When the man has been "improved" out of such tastes his ideas generally expand, especially as regards wages, and so when you think you will benefit by teaching him, you run the chance of only being at a further disadvantage. Even with the methods at present in use, although these are not ideal, they allow of fairly rapid tapping; and as already the tendency is to overtap the trees, an implement that is capable of increasing the present yield three-fold, like the one discussed at the beginning of this article, would, we should imagine, only tend to aggravate the position, for if the latex is not there, or cannot be spared, we fail to see how it can be got out. No one, however, is infallible, especially as regards the ideal tapping tool, or the maximum yield obtainable; discussions, however, lead one to see what can be and what cannot be done, and we have, therefore, given up this space to criticizing some of the current ideas for the extraction of latex from Funtumia trees to help solve the riddle.

CONGRATULATIONS are due to the *Louisiana Planter*, which not unreasonably claims to be the leading sugar journal of the world, for with its issue of July 5th, just to hand, this journal completes its twenty-fifth year of existence, which it is celebrating by issuing this number as a special birthday edition, with a review of the sugar industry in America during the past twenty-five years. Sugar planters in Latin America, and even in Spain, who cannot read English will await their first copy of the proposed Spanish edition of the *Louisiana Planter*, concerning which a conspicuous announcement is included in this their twenty-fifth anniversary number. In face of the increased importance of the sugar industry in a Spanish-speaking country, such a journal is bound to prove a great success.

ACCORDING to French official reports, coco-nuts in French Guinea thrive well along the sea coast, reaching inland about thirty miles into the forest region. They begin to bear at 8 years of age, and yield an average of 33 lb. of copra per tree per annum, worth 15s. 9d. to 18s. per cwt. (112 lb.). The principal trading firms are those of Hamburg, Liverpool, and especially Marseilles, which buys yearly about £3,200,000 worth of copra from Manila, Ceylon, Singapore and Mozambique. The colonies of the Ivory Coast and the French Congo, richly endowed with dense forests, would lend themselves to the exploitation of this palm better than French Guinea, where, however, it would be easy to grow it along the coast, instead of which it seems quite abandoned in French West Africa.

Reviews.

ELEMENTARY TROPICAL AGRICULTURE. By W. H. Johnson, F.L.S., Director of Agriculture, South Nigeria; ex-Director of Agriculture in the Gold Coast and Portuguese East Africa. 150 pp., including the index. Figs. 20. Demy 8vo. Price, 3s. 6d. net; 4s. post free. Crosby, Lockwood and Co. London: 7, Stationers' Hall Court, Ludgate Hill, E.C., and 5, Broadway, Westminster, S.W.

This book, by the author of, we believe, the first handbook published on "Hevea Rubber," of which a second, if not a third, edition has been published, and of "Cacao, its Cultivation and Preparation," will be found exceedingly useful. It is reliable and concise, and crowds in a few words a combination of facts regarding the soil, its preparation and cultivation, of seeds and their selection and germination, and of the functions of the different parts of plants, and the effect of manures, that, even when already known, are in handy form to refer to. Insect pests are also discussed, and there is a chapter of short paragraphs on how to plant subsidiary crops, as beans, ground-nuts, cassava, cotton, vegetables, &c., that will be found very handy to run to. We have already done so, several times.

THE CHEMISTRY OF RUBBER. By B. D. Porritt, Chief Chemist to the North British Rubber Co., Castle Mills, Edinburgh. 96 pp. Price 1s. 6d. net. Gurney and Jackson, 33, Paternoster Row, London, E.C.

This book apparently forms one of a series of chemical monographs, being issued by Messrs. Gurney and Jackson, any of which will be found most useful to those interested in the various trades discussed. The present one is decidedly scientific in character, and contains many formulas or tables to show the constitutions of the various bodies, as caoutchouc, &c., the whole forming a short and concise account of the chemistry of rubber, the technical descriptions of which have been limited to such details as are necessary for a clear insight into the chemical questions involved. Having had the pleasure of inspecting the Castle Mills of the North British Rubber Co. at Edinburgh, and especially their extensive and highly scientific laboratories and testing rooms, we can realize the exceptional opportunities that the author has had to make so complete a study of the chemistry of the rubber of commerce, that this monograph shows him to possess.

FATTY FOODS. By E. Richards Bolton, F.C.S., and Cecil Revis. 371 pages, including index, thirty-five drawings, and seven plates. Price 10s. 6d. net. Messrs. J. and A. Churchill, 7, Great Marlborough Street, London, W.

We prophesy in times like the present, when, in spite of the enormous output of coco-nut and oil-palm products, there is not nearly enough to go round, that this book will be carefully read and widely discussed, both by producers and manufacturers. Coco-nut, palm-kernel, Cohune and Japan tallow oils, are discussed in one group, cacao-butter, palm-oil and five others in Group II; olive ground-nut, and almond

oil in Group III; rape oil, &c., in Group V; cottonseed, kapok, soya, maize and sesamé oil in Group VI; linseed, rubber, perilla, and six others in Group VII; then come fish and marine oils, rice, wheat, hemp and tiger-nut oil, milk, &c. Even this cursory notice will show, therefore, that the book cannot be overlooked, especially when we remember that Mr. Richards Bolton comes next to Lewkowitsch as our leading authority on fats, and Mr. Cecil Revis is connected with one of the largest, if not the largest, milk-supplying concerns in London. Students and investigators of the various groups will find the illustrations of considerable use and will probably welcome the ingenious manner in which ruled sheets are inter-paged between the sections or groups to make notes on.

THE REDUCTION OF DOMESTIC FLIES. By Edward Halford Ross, M.R.C.S., L.R.C.P., of the Lister Institute of Preventive Medicine, London, and formerly of the Liverpool School of Tropical Medicine. 103 pp., including index, with 18 photographs and figures. Price 5s. net. London: John Murray, 50A, Albemarle Street, W.

The object of this book, as the author tells us, is to bring to public notice the necessity for the reduction of domestic house-flies in cities, towns, villages and rural districts. Many diseases are believed to be borne to human beings and spread generally through towns and villages by the house-fly. The ravages caused by them among children seem especially to be as little known and guarded against as they are serious. The havoc the fly can work in its short life, among children and adults alike, is well set forth in Chapter XI on "The Life and Death of Worry, the Fly." This, and the chapter (VIII) on "Organized Anti-fly Campaigns," would alone make the book worthy of attention by doctor, sanitary officer, and the general public alike; the whole of the book, however, deserves careful study and consideration, and shows the stern need, as the Americans say, tersely if not elegantly, to "Swat that fly!"

THE interesting discussions concerning the methods of disposing of the Plantation Rubber Companies' outputs continue, report Messrs. Zorn and Leigh-Hunt. That there is room for drastic reforms cannot be questioned, and there seems little doubt that the glaring discrepancy between the prices of Plantation and Pará rubber is brought about by circumstances other than the natural laws of supply and demand. How matters are to be remedied it is not very easy to say; but many of the big producers have expressed themselves in favour of an endeavour to improve the sale conditions, and no doubt, also, more will be heard of the various schemes at present being formulated with a view to regulating the quantity of produce coming to market.

Full particulars regarding the Plantation Companies and their capital, acreage, cultivation, rubber-production, &c., &c., will be found in the various issues of the firm's "Manual of Rubber Planting Companies," and should be carefully studied by those anxious to see Eastern plantation rubber get its full market price.

"Tropical Life" at the Play.

AT times it is difficult to decide whether the law is an ass to be tolerated and blamed, or a much harassed, misunderstood machine striving hard to deal out protection and justice all round if those administering it would only allow it to do so. In no instance is the law, perhaps, more needed and makes more mulls than in protecting employers from theft and embezzlement, and employes from unjust treatment and false accusation, than in the huge modern concerns employing hundreds and even thousands of hands at a time. So difficult is the position, that both sides seem to recognize it and are loth, we believe, as a rule, to apply to the law for help, fearing lest, when they do so, that the innocent may suffer for the guilty. How just such a case may happen is dramatically, but we feel faithfully, portrayed in the play entitled "Within the Law," at the Haymarket Theatre, produced by no less a master than Sir Herbert Tree. With such a plot and director, coupled, be it added, with one of the most suitable casts imaginable for such a play, we felt thoroughly repaid by a visit there. The fact that the plot was adapted from the French shows that the trouble to secure perfect justice is not confined to this country. In the play Margaret Taylor (Miss Edyth Goodall) is sentenced to and undergoes twelve months' imprisonment for a theft committed by someone else, with the result that her nature, hitherto kindly and well disposed to all, becomes hardened and engrossed with the one idea to wage war against all and everyone so long as she did so "Within the Law." Further details we have no room to give, only adding that from an excellent cast Mr. Frederick Ross as Edward Gilder, the proprietor of the emporium, Mr. J. V. Bryant as Richard, his son, and Mr. Lyall Swete as the solicitor, stood out prominent among the men, whilst warm congratulations are due to Miss Edyth Goodall as Margaret Taylor, the falsely imprisoned shop-girl, and Miss Mabel Russell as Agnes Lynch, a member of the criminal association, whom Margaret befriended.

From so faithful a portrayal of these hustling times it was a change to be transferred, at the Royalty Theatre, away back to 1860, when we were introduced to the first period of "Milestones," when the *Warrior*, the first warship in the British Navy built of iron, was launched. Such times were different to those of to-day. Here Mr. Dennis Eade as John Rhead, and Miss Hendee Wright as Gertrude Rhead, carried off the chief honours, and, with the other members of the cast, caused us to enjoy the play throughout, especially where we are so forcibly reminded of the changes in the various periods and that our ideas as to what is wanted to-day and what will be required to-morrow are by no means confined to ship-building.

A GERMAN in Peru has invented an electrical tapper for rubber trees with hollow iron channels, divided into sections which are fitted on the trunk. These sections contain pricking devices that can be worked at varying times by currents from the central station. A receptacle in each section catches the latex, coagulating it with acid. It can be left for months and will collect 200 or 300 lumps of rubber in the meantime.

INDIAN TEA ASSOCIATION NOTES.

THE export of tea-seed from British India during April last amounted to no less than 72 cwt., against 17 cwt. last year. "It is difficult," said the *Indian Planters' Gazette*, commenting on so large an export, "to understand what tea-seed could have been exported in April last. It would be interesting to learn where it came from." It will be remembered that in our April issue we quoted the same contemporary when it expressed doubt as to whether the planting community realized the quantity and value of the exports of tea-seed from India, a large quantity of which found its way to Java, with the result that on account of the rapidly increasing output that centre has found it necessary to discuss the *pros* and *cons* of a cess fund to exploit new markets for their teas. Whilst this is a wise move on their part, it is just as well for the planters in India to note what is happening, and also Ceylon, but for another reason, which is this. If Java, as it is proposed that she shall do, as well as India, runs an aggressive sales campaign, Ceylon, if she does not want to lose the cream of her market, will have to "disburse" as well. These are troublesome times when no one leaves "well alone," but being so, those who do not wish to be up and doing, and pay the cost, run a bad risk of losing ground.

We meant to have quoted from Messrs. Wm. Jas. and Hy. Thompson's Annual Review of the Tea Trade for the year ending March 31st, for it is full of information and worth studying carefully, but space forbids. Speaking of Java, they tell us that the output again shows rapid expansion, the official report giving the total out-turn as 61½ million lb., as against 50¼ million lb. last year; the ratio of development was, however, less in 1912 than in 1911, and this is attributed to climatic conditions which were not so favourable during the second half of the last season.

In April we also reported results of experimenting with explosives in the tea garden. The Ceylon press, in commenting on the matter, says: "This subject is dealt with in an interesting manner in the quarterly journal of the Scientific Department of the Indian Tea Association, experiments in Assam, Cachar, Sylhet and the Dooars having been carried out. The results are said to have been favourable. Drainage has been improved by the breaking up of the 'hard pan' stratum of the soil, and tea replanted in abandoned land after dynamiting is said to be better than on similar land not so treated. No particular explosive is mentioned. The chief value of explosives, according to a writer in the journal, will be in the possibility of deep cultivation: that is to say, cultivation of the subsoil at a depth of 3 ft. or more, such as could never be obtained by trenching or deep hoeing. Old tree stumps may be uprooted and drainage and trenching carried out with explosives."

In respect to the sale of Indian tea in London, Messrs. Wm. Jas. and Hy. Thompson reported on July 10th that the market was somewhat irregular, but this feature is getting less evident as supplies of New Season's become larger and a more representative selection is available. The demand has been stronger for tea generally, more particularly for Assams, and these were inclined to be dearer. Dar-

jeelings were also a good market, and, although quality is barely equal to earlier arrivals, previous rates were often obtained. For Dooars descriptions the demand, on the other hand, was hardly as good, and sometimes a slightly easier tendency was discernible. Common tea remains steady. The sales were well attended, and nearly all sections of the trade were interested. Among the best averages were: Darjeeling—Goomtee, 1s. 3d.; Tukdah, 1s. 1¼d.; Ging, 1s. 0½d.; Ambootia, 11¼d.; and Chamong, 11d. Assam—Lattakoojan and Behali, 9¾d.; Bhootia Chang, Phulbari and Sepon, 9½d. Dooars and Terai—Chalouni, 9½d.; Nagaisurie and Lankapara, 9¼d.; Gungaram (Ord), 8¾d. Nigiri, Travancore and Wynaad—Erramaculla and Vembenard, 8½d.; and Ladrum, 8d. The average for the whole sale on garden account was 9¼d. per lb., against 9d. per lb. a year ago, whilst the average for Ceylon was 8 3-5d. per lb., against the same price last year; and for Java, 8 1-5d., against 8½d. in 1912.

The weather in the tea-producing districts of Northern India has been erratic, and the crop to date compares unfavourably with last year. Heavy rain, resulting in floods in many parts, is reported, and it is feared that the jute and paddy crops must seriously suffer, while bheel gardens and low-lying areas are inundated, the level of the rivers and large streams being as high as the surrounding country, all of which must temporarily affect out-turn.

The new season crop is slowly coming to market, the teas being of fair average quality, for which there is a good demand, and so far as can be seen everything points to a strong market for some time to come.

During the first six months we are glad to be able to report that the home consumption has risen by 5½ million lb., and exports by 5 million lb.; at the same time stocks are 4 millions heavier.

Our tea-planting friends who are now shipping larger quantities to France must not ignore the new French regulations with regard to packing of tea (*i.e.*, that tea must be separated by paper from the lead), as these will apply to all teas cleared on and after January 1st, 1914, whether they be cleared from bond or direct from countries of origin. Similar regulations, it is believed, have been imposed by the Swiss Government, under the Health Foods Act. We cannot help describing these regulations, at any rate so far as British-grown teas are concerned, as needless and "grand-motherly," as it is quite obvious that no deleterious effect could result from the contact of lead with a dry substance such as tea.

MESSRS. DAVID BRIDGE AND CO., LTD., have been very busy in their dryer department. The copra dryer made for the Government of the Philippine Isles has been delivered and paid for, and so has the one sent out to the order of the Crown Agents in Fiji. Another machine was recently sent to Nigeria, whilst a copra dryer is on order for the Malay States, and another for cacao for Jamaica. Both the latter are well in hand, and will be delivered at the earliest possible moment.

A Book on Bananas.

THOSE of our readers who plant, or are otherwise interested in the production of bananas, will be glad to be reminded that a standard work on the subject, bearing the title of "The Banana," is shortly to be issued. The object of the author, Mr. Wm. Fawcett, B.Sc. (who is generally regarded as the greatest living authority on this useful fruit, having enjoyed, as Director of Public Gardens and Plantations in Jamaica from 1887 to 1908, unique opportunities of studying the banana industry in that island, which exports over 16,000,000 bunches annually), is to give in popular language a complete survey of the banana industry from the planting of the sucker to the marketing of the fruit.

At the same time we are glad to learn that the opportunity has been taken to increase very largely the information already given from time to time and to add several chapters on fertilizers, the banana as a nurse plant and catch crop, diseases and pests, the fibre of various species of the banana (*Musa*) family, such as Manila hemp, the making of alcohol from bananas for industrial purposes, &c. A review will also be given of all the species of banana, whether wild or cultivated, and notes added of botanical and horticultural interest.

The consumption of bananas is increasing rapidly year by year, and consequently it is necessary to put more land under cultivation in every part of the Tropics. Much use, besides, is being made of the banana plant as a nurse plant and catch crop. When the culture is on a commercial scale it is necessary for planters to enter upon it in a scientific as well as a practical manner, just as they do when planting rubber, sugar, or cacao. This book is intended to assist such planters in many ways, and also to be a guide to those who are taking up the culture for the first time. It is hoped that it may also prove interesting to the general trader and shipper, as it deals with the life history of the plant and its cultivation in various parts of the Tropics; the immense value of the banana as food, either as fresh fruit, dried as "banana figs," or made into flour; and the history of the development of the fruit trade, both in the United States, where it has assumed enormous proportions, and in Europe, where it is still in its infancy, is certain to cause a run to be made on such a book as soon as it appears.

A CUBA correspondent writes us as follows:—

"In TROPICAL LIFE for March of this year, on page 44, appears an article entitled 'The Fertilization of Tropical Crops,' in which reference is made to the benefits bestowed upon those countries where the Potash Syndicate and the Chilean Nitrate Committee are carrying on their propaganda work.

"I would like to send a number of marked copies of this journal to President Menocal (of Cuba) and various members of his Government, and will appreciate it if you can send me ten or twelve copies. If any expense is necessary in securing them the amount can be charged to my account.

"I will also thank you for securing and forwarding to me a copy of your book 'Coco-nuts, the Consols of the East.'"

Odd Notes.

AN important meeting of the Committee to arrange next year's Congress of Tropical Agriculturists, from (Tuesday) June 23rd to June 30th, took place at the Imperial Institute on July 15th, Professor Wyndham Dunstan, C.M.G., F.R.S., &c., President of the International Association, in the chair. Those present included Messrs. Kelway Bamber, H. N. Ridley, C.M.G., M.A., Gerald Dudgeon, Silva White, Harold Brown, the Editor of TROPICAL LIFE, and Dr. Henry (Secretary). We hope to include in our August issue a preliminary list of suggested arrangements.

Dr. Oscar Loew, whose essay on the fermentation of tropical produce stands second in our book on the subject, expresses interest in our leader in the June issue on the possibility of utilizing Mongol labour in Latin America. "This article," he writes, "interests me very much. Surely the Japanese born in Brazil will make just as good Brazilians as Germans or any other European nation. By inter-marriage with whites an excellent mixture results, as experience shows in Tokyo. I consider that California is making a mistake; Brazil is certainly doing right in attracting the Japanese."

Tropical planters and shippers are noting the change in our old friend *The Tropical Agriculturist*, founded in 1886, by our still older friend, who is, we understand, going strong, Mr. John Ferguson, C.M.G., but we are not at all sure that every one cares for the change. If the viands offered are more *recherché*, the number of courses is decidedly less; whether it will continue so remains to be seen. The changes are caused by *The Tropical Agriculturist* having been purchased by the Ceylon Agricultural Society, who are now sole proprietors. The May number reproduced in full our March leader and cartoon on "Agricultural Colleges for the Tropics," which we are glad to say has come so prominently to the front on this side as well.

In a paragraph dealing with rubber growing in Formosa, the *Yokohama Chamber of Commerce* tells us that in view of the possibilities of rubber production in that island, the Government-General has for some time past been conducting various investigations and has established experimental stations at Koshun, Kagi and at some other spots. As a result it has been found that, of the rubber trees of various kinds, Pará and Manihot are best fitted for cultivation in the Island. Accordingly Mr. Murai and Mr. Fujii, both Engineers of the Government-General, have established cultivation stations for the purpose of growing these trees. Manihot rubber is said to be superior in quality to Pará and to contain a greater quantity of sap than the other, but suffers more by high winds than Pará rubber, which, though not so fine in quality as Manihot, may almost be regarded as windproof. Every convenience is being afforded to whoever desires to establish rubber plantations, it being the authorities' policy to encourage the undertaking in every way possible.

The second quarterly issue of the *Bulletin* of the Imperial Institute, vol. xi (1913), No. 2, contains, among the Reports of Recent Investigations by the Scientific and Technical Staff, an article on cotton-growing in the Sudan, with reference chiefly to the

proposed scheme for cotton cultivation under Anglo-Egyptian auspices, involving a guarantee by H.M.'s Treasury of the interest on a loan to be raised by the Sudan Government amounting to three millions sterling; and the space usually occupied in the *Bulletin* by special articles is devoted exclusively to a comprehensive report (illustrated) on "Tea: Its Cultivation, Manufacture, and Commerce," by Dr. S. E. Chandler and Mr. John McEwan, a notable feature in which is the pre-eminence, in the figures quoted, of the people of the British Empire as tea-drinkers—the consumption *per capita* being no less than ten times that of foreign countries, excluding the United States. A notice on the cultivation and preparation of Turkish tobacco refers to the progress made, in that respect, in South Africa. Among the General Notes is an interesting reference to the rock structure of Egypt, contained in a recent Report of the Egyptian Geological Survey, to the effect that, contrary to the prevalent view, "erosion following local folding"—and not fault-effects, or trough-faulting—is, perhaps, sufficient to account for all the observed conditions.

We understand from the *Proceedings of the Agricultural Society in Trinidad (W.I.)* that experiments with dynamite were recently carried out at the end of May before members of the Agricultural Society by Mr. Harry Vincent at the Government farm. A cane field of first year's ratoons was dynamited, one third of cartridges being exploded in holes 18 in. deep and 8 ft. apart. In a banana field $\frac{1}{2}$ cartridges were used placed at 10 x 10 ft. and 2 ft. 6 in. deep. A field was prepared for the planting of coco-nuts by exploding full cartridges ($\frac{1}{2}$ lb.) in 3 ft. deep holes at 25 x 25 ft. On another field intended for the planting of ground provision one third cartridges again were used at a depth of 18 in. in holes 8 x 8 ft. apart. The soil on which these experiments were conducted is a deep sandy loam. Many members of the Society attended the demonstration. No particulars were included as to the results; so we shall look out for these in a future issue. Meanwhile, we would refer readers to our Tea Notes on p. 66 of the April number, and page 126 of this issue, for the favourable results reported from the use of dynamite on tea lands. We are glad to see the matter is receiving more general attention.

Rubber having "slumped" (says one of the London papers), makers and users—and often losers—of golf balls are in open conflict as to the proper price to be paid for a first-class article.

Golfers point out that in two years the price of rubber has dropped from approximately 12s. to 3s. per lb., and that golf ball makers, although they took advantage of the rise to charge half-a-crown for a first-class ball, have made no reduction since.

Not unnaturally, therefore, the clamour is for cheaper balls. Whether these are expected to drop to 7½d., or one-fourth the price, in proportion to the fall in the case of the raw material, we are not told, but we certainly think that the golf-players deserve some reduction in face of the present cheapness of raw rubber, especially as many of them are rubber shareholders, and to get so low a price for the raw material and still pay so high for the manufactured article is asking more of (some people's) human nature than seems quite fair or reasonable.

Dr. Francis Watts on Wide Planting.

CHATTING with Dr. Watts, head of the Imperial Department of Agriculture for the West Indies, over our article on "Wide Planting" on p. 113 of our June issue, he was good enough to point out that (using his own words) "with regard to the cultivation and tillage of orchards, in which term I include permanent crops like cacao, oranges, rubber, &c., I find it impossible to lay down any hard-and-fast rules; each particular case must be treated on its merits, as so much depends on the conditions and texture of the soil. If there is a tendency on the part of any particular place or soil to lose condition or to become close or hard then tillage must be resorted to, but in general I think a mistake is commonly made in trying to apply the methods of temperate arable farming to tropical orchards. I think that abroad such work in some of its aspects may approach nearer to forestry than to arable farming, and I am always trying to get people to study the condition of forests as well as of ploughed fields. Such work needs careful study on the spot, and not rules devised in laboratories and studies. We do not know enough yet; these subjects would be good objects for investigation in an Agriculture College and Institute of Research."

In fair play to Dr. Watts, we must add that the above remarks were not made with a view to being published, neither did we ask for permission to publish them; at the same time, coming from such a source they are well worth noting.

ACCORDING to the *Chinese Republican*, the Ministry of Agriculture and Forestry in China has appointed Wang Li-hsien to investigate the agricultural conditions of the Republic.

Economic Zoology.

Our Motto: "Utilization, not Extermination."

Conducted by FRANK FINN, B.A., Hon. F.Z.S.

THE SPECIES AND DISTRIBUTION OF WHITE EGRETS.

As white egrets are at once the birds whose utilization by the plumage trade is most cried out upon, and those which could be worked humanely and profitably for plumes in the easiest manner—supposing their capture to be conducted under proper regulations, or farms to be established—I have thought it as well here to review the known species and races of these birds, as there seems to be little exact knowledge of them current among those interested. The typical all-white egrets, from whose nuptial plumage the well-known white "osprey" plumes are taken, are of very wide distribution, but few in species, though often numerous individually. In breeding plumage they are easily distinguished one from another, but when the nuptial "osprey" plumes are shed they look much alike except in size, and even this in the largest species is very variable.

THE LARGE EGRET.

To this species I refer the various races referred to in the "British Museum Catalogue of Birds," vol. xxvi, pp. 88-100, as *Herodias alba*, *H. egretta*, and *H.*

timoriensis. Of these the original *Herodias alba* inhabits Central and Southern Europe, all Africa, and Central and Southern Asia; *H. egretta* is the American form, ranging all over the New World south of the Northern United States; and *H. timoriensis* is found in Australia, New Zealand, and North China and Japan. I class all these large egrets as one species, because they agree in certain essential points; they are all large birds, measuring a yard or more in length—though there is much variation in size even in the same locality; they have no crests, and the “osprey” plumes, which are, naturally, long in such big birds, grow on the back only. These plumes are most fully developed in the American race, in which they may reach 9 in. beyond the tail, and shortest in the Australasian type, though even in this they may extend 6 in. beyond the tail, and a bird carrying seventy plumes, the longest 18 in. long, has been recorded from New Zealand. This individual had a black beak, although this *timoriensis* form is supposed to be yellow-beaked all the year round; the American race has the beak yellow, simply partly marked with black at breeding time, and the *alba* of the western and central parts of the Old World has the beak yellow in winter and black in the breeding season. These distinctions in bill-colour and plume-length are evidently not of importance as marking distinctness of species, though, of course, the longest-plumed race would be the best, other things equal, for cultivation; there is not the slightest doubt that all the races would interbreed if brought together, and that all constitute one locally and individually variable species. This species, then, which is *the egret par excellence*, far from being a miserable creature on the verge of extinction, is really almost the most widely distributed bird in the world, and if properly looked after ought to be the commonest bird of its size; the great range it inhabits shows that it is very adaptable to varied climates and conditions.

THE MIDDLE EGRET.

Under this head come the “species” referred to in the above-quoted volume of the “British Museum Catalogue of Birds” as *Mesophoyx intermedia*, *M. plumifera*, and *M. brachyrhyncha*; here again, we get a trifling distinction made between local races, and a separate section *Mesophoyx* made for birds which ought to rank as a species of the *Herodias* group. All the middle-sized egrets are Old World birds. The typical *intermedia* is found in India, Ceylon, China, Japan, and the Malayan Islands; the race *brachyrhyncha* is African, and the *plumifera* race inhabits Australia and the adjacent islands, but not New Zealand. These races only differ in trivial points of difference as to the amount of yellow on the bill, &c., which may be disregarded.

The essential points of this middle egret, including all the local forms under this one name (*Herodias intermedia*) are a medium size, the length being just over two feet, a beak rather shorter in proportion than the large egret's, and either black or yellow, according to season or locality; but most particularly, in the “osprey” plumes growing on the breast as well as back, although, as in the large egret, there is no head ornament. The back plumes are about as long in this species as in the larger one, reaching far beyond the tail in all cases; in the “British Museum Cata-

logue” the Indian race is recorded as having back plumes 17 in. long, and breast plumes of 8 in.; this species is, therefore, far the most abundant plume-bearer of any, and if any of the egrets is to be specially selected for cultivation in confinement or introduction into such places as the Pacific Islands, where no typical egrets exist, this would be the best one to take up. It also has less fear of man than the others, as this is the kind that is found often breeding on trees in towns and villages in India.

Coming to the small egrets, we find that here there are two well-marked species, just as there are two of the larger type.

THE OLD WORLD SMALL EGRET.

This exists, according to the “Museum Catalogue,” in two forms, the typical *Garzetta garzetta* and *G. nigripes*; distinguished by a niggling difference in the colour of the feet, black like the legs in one, and yellow in the latter. The former bird is the small egret of Southern Europe, and ranges all across to Japan and south throughout Africa; the latter's range begins at Java and extends to Australia, but not New Zealand.

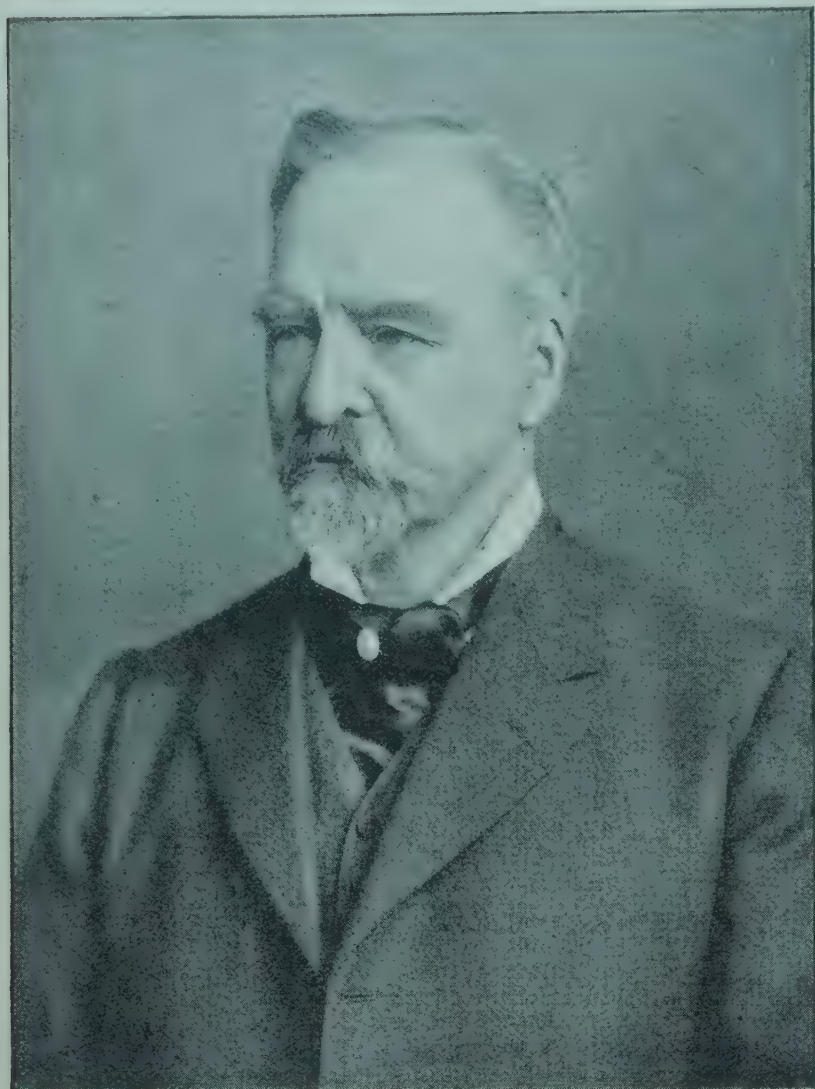
This small egret's essential characters are: Small size, the length not reaching 2 ft.; “osprey” plumes on the back only, delicate, and turned up at the ends; a crest of two long thin but ordinary textured feathers, and a long thin bill, always black. In the New World the small egrets are of a different type.

THE SNOWY EGRET.

This is allowed to form one indivisible species, *Leucophoyx candidissima*, ranging nearly all through America, from the northern United States to Argentina; thus it exists alongside the American race of the large egret, just as the small egret of the Old World does alongside the races of large egret there, and in South-Eastern Asia and Australia the middle egret as well. The essential characters of the snowy or small American egret (it is no more and no less white than the rest) are, in addition to small size, less than 2 ft. long, and long bill, which it shares with the Old World small egret, the bearing of “osprey” plumes not only on the back, but on the breast, like the middle egret of the Old World, and even on the head, a character found in this species only of all the egrets. As the bird is small, of course the plumes are short also; but it obviously has the greatest number of any, and would be a good bird for introduction where a small species is wanted.

This completes the list of the world's white egrets. The two races of the buff-backed egret (*Bubulcus lucidus* of Europe and Africa, and *B. coromandus* of Tropical Asia, stand in a different category, although all white when not in breeding plumage. They are of the size of the small white egrets, but have short yellow bills; their plumes are not in such demand, but they are, being insect-eaters, far the most useful and also the most active and ornamental of all egrets.

IN their review on our book on “Coco-nuts,” *Der Tropenpflanzer*, of Berlin, says, “The book contains many practical hints, and on that account can be warmly recommended to planters.”



"Tropical Life" Friend.—No. 97.

MR. ROBERT CHRISTISON.

A Believer in Agricultural Colleges in the Tropics.

MR. ROBERT CHRISTISON, who is best known, perhaps, as a Queensland pioneer, is a son of the Rev. A. Christison, and went to Victoria as a boy of 15. He obtained experience in stock and stock-raising on the stations of the Chirnsides and others, and decided to explore and take up land farther than the farthest-out settlement. Landing at Bowen in 1864, when he had to swim his horse ashore, he examined the country which was being stocked with sheep between the coast range and the sea; then he bought three months' provisions and struck out west, along the 21st degree of south latitude. A week's travel brought him to the finest pastoral country, eighteen hundred feet above sea level, undulating plains and downs, with water courses flowing east into the sea, north into the Gulf of Carpentaria, and south into Lake Eyre, in South Australia. After exploring this country, "Our Friend" returned to Bowen and took up at the Lands Office two thousand square miles, calling the property "Lammermoor," after the hills of his birthplace.

Now began the process of developing primitive country, stocking it with sheep, cattle and horses from the South. As the supply of cattle was established the necessity grew for reaching larger markets. This was the starting-point of a great industry, for Mr. Christison is the founder of the first meat export works in Queensland, in conjunction with Sir Richard Cotton, then Lord Mayor of London, Mr. Sampson Lloyd, Mr. Bosanquet, and others. A factory was erected at Poole Island, Port Denison, at a cost

of £120,000, with freezing machinery to chill 65,000 cubic feet of space, enabling five hundred tons per week to be treated for shipment. The first shipment, one thousand carcasses of beef, sold to the Batavian Government at 4d. per lb., was frozen successfully and loaded on board the ss. *Fiado*, which was to leave for Java the following morning, when an unreckoned disaster overwhelmed the new enterprise suddenly. The greatest cyclone on record swept over the coast, the sea between Gloucester Island and Poole Island rose 6 ft. above the marks of the highest king tide, and drove the *Fiado* high and dry on the mainland. It smashed the large punts which carried meat to the ships and coal to the works, sank the steam-launch and tore away the stone sea-wall that fronted the great reservoir, so that circulating water was no longer available to keep the works running. The *Fiado's* cargo was thrown overboard and the meat was buried. No insurance could be effected in those days, so Mr. Christison and the other investors lost heavily; but this venture opened the way for others and now export factories are studded all over the Commonwealth.

The Lammermoor cattle and horses were brought up to a high pitch of excellence, the well-grassed country could carry increased numbers, but large tracts of fine country were unavailable for lack of water. To secure permanent water, "Our Friend" made a reservoir which threw the water back $1\frac{1}{2}$ miles by 300 yards, with a depth of 34 ft. The cost was £1,600.

Though retired from pastoral pursuits in Queensland, Mr. Christison is still actively engaged in furthering the progress of his adopted State, and has interested himself generously in hospital work and in the Church and the Salvation Army; but the project to which he is specially devoted at the moment is the foundation of a Faculty of Tropical Agriculture in the University of Queensland. It was this which brought him prominently to the front as a speaker at Sir Robert Perks's "At Home" in support of agricultural colleges in the Tropics, of which a report will be found on p. 132.

Having urged the foundation of this Faculty, on his recommendation being endorsed by the energetic Chancellor and Senate of the young University, Mr. Christison placed £1,000 with the Senate towards funds for establishing this Faculty, and has promised another thousand when the sum at present collected has been brought up to £9,000. The committee appointed by the Queensland University holds funds amounting to £5,600, almost enough to equip an efficient laboratory, but a further sum is needed to maintain a competent staff. The Queensland University is admirably situated for tropical studies in Brisbane, being on the threshold of tropical Australia and within reach of New Guinea, the Straits Settlements and Singapore. Mr. Christison holds that with closer settlement more specialized study must be given to agricultural and pastoral resources, and a Faculty of Tropical Agriculture such as he hopes to see established in Brisbane shortly would provide expert scientific knowledge for dealing with the problems which appear as the country develops. As the problems which Queensland is already facing are confronting other centres in the Empire, this Faculty of Tropical Agriculture in Queensland will further not only local but Imperial interests as well.

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7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

JULY, 1913.

The Trek to the Tropics.

WHY ENGLAND MUST ESTABLISH AGRICULTURAL COLLEGES IN THE TROPICS.

INDUSTRIAL expansion, the growth of factories, the suction-like encroachment of towns and cities throughout agricultural areas, causing the lanes and fields, as well as the rustics and their families, slowly but surely to disappear, are rapidly converting England, and Europe also, into one vast manufacturing and industrial centre, into which everyone's food has to be brought from outside, since there is no longer any space left to produce it locally, or even if an odd corner has been overlooked, the necessary labour is lacking to work the land and produce crops as abundantly and economically as they can be elsewhere, especially in the tropical and sub-tropical centres.

Conservative estimates long ago placed the percentage of the increase in the population of industrial centres due to the exodus from the country at 10 per cent.; if this was then correct, the proportion has probably increased to 15 per cent. to-day. But whether 10 per cent. or 15 per cent., such a movement brings a double evil on to the community, and adds to the perplexities of those governing it, owing to the easily realizable fact that it means there are 10 per cent. to 15 per cent. more mouths to be fed, but 10 per cent. to 15 per cent. less producers to feed them. At the very least, therefore, there is a difference of 20 per cent. in the position of the supply and demand of food-stuffs generally, whilst most will agree that, so far as London and the great cities and manufacturing centres are concerned, the difference on balance is nearly, if not quite, 30 per cent. Owing to this the rise in the cost of food and of living generally, owing

to the competition in the game of grab for each to get something, for there is no longer an abundance to go all round, has been very serious both to the weekly wage-earner as well as to all employers of labour, and is causing wages to mount up far too fast for the employer, but by no means fast enough, as a rule, for the employed, who tells you that he is still worse off to-day than he was on the old rate of pay and cost of living.

Apart from the discomfort to the individual,* this shortness and consequent dearth of food supplies are a danger to the State,† and also sadly handicap and discourage its industrial prosperity and export trade, and the evil will increase rather than become lessened as time goes on.

Even if this, the present state of affairs, would stop where it is, the position would not be so bad, one might adapt oneself to it in time, but this is impossible. The cost of "running" an Empire, or satisfying the requirements of the factories and factory hands that go to build up that Empire, tends to mount up, year by year, even in times of peace. What will happen in times of war is not pleasant to think of. Meanwhile, leaving other people to look after themselves, the Government of this country has to face the fact that if they want peace and plenty in the United Kingdom, and especially if they want to go on drawing increasingly large sums from the pockets of the British public, whether peer, merchant-prince, clerk, or artisan, they must leave no stone unturned to assure that not only the present supplies of our raw material and food-stuffs should continue, but that at least a 10 per cent. annual increase should be provided for; and if steps are not taken to assure this, a curtailment of trade will ensue. It was the agitation of the Lancashire spinners over such a curtailment of their supplies of raw cotton some years back that brought the British Cotton Growing Association into being; and, as we showed in our April issue, competent authorities point out that the serious curtailment of the supply of soya beans from the East has affected and stunted what promised to become an important oil-pressing business around Hull. Neither of these shortages should have occurred. Had we been given the same facilities to train men to become planters in the Tropics, as we have had for many years to train them to become doctors, lawyers, engineers, &c., not only should we have been assured of all the cotton and soya beans we need, but would probably have had a surplus to sell to other countries. Meanwhile the placing out of such men with capital to develop and plant up the land can, if carried out along

* A discomfort by no means confined to England or Europe, as anyone who has bought rice, dhall, and coolie stores in India for shipment to the West Indies for the past thirty or even twenty years can prove. The wholesale price of butter to-day at centres like Morlaix in Brittany compared to what it was in the early eighties is another proof. Again, as pointed out in our June issue (p. 111), one of the main reasons why Japan is so anxious to encourage the emigration of families on a large scale to South America, particularly Brazil, is because the authorities recognize that there is not enough rice to go round, and each year tends to see the trouble further aggravated.

† See TROPICAL LIFE for December, 1912, p. 232, where we say: "Seventy years after the introduction of steam comes the turn of the Tropics and coloured races, to be utilized for their benefit, and that of our own people. Empty stomachs have caused, and always will cause, more trouble in this world than hot heads. Let us, therefore, take the opportunity to open up with our capital the sluices leading to fresh channels of employment."

the right lines, greatly benefit the inhabitants of those centres, although we all know that this has not always been the case. A steady scientific-cum-practical training such as we suggest, and thinking men interested in the Tropics are asking for, would cause the right class of man to go across, in place of the exploiting adventurers who have been the pioneers of tropical development in the past and still are to-day. Under the better regulated system the purchasing power of the Tropics would be greatly increased, so that they, in return for their raw material and food-stuffs, could take our manufactured goods and machinery to a much greater extent. If the following remarks are true of the Gold Coast (which they are), how much more forcibly would they apply to the rubber and coco-nut lands awaiting development by scientifically trained efforts in Malaya and elsewhere? "The Gold Coast in 1912," reported the Supplement of the *Chamber of Commerce Journal*, "produced more cacao than any other country in the world. These large shipments of cacao and other products are evidence of the material prosperity of the natives of that colony, which gives rise to increased imports. Visible progress has been made in agriculture and education among the natives, and important sanitary improvements have been carried out."

This is an advertising and pushful age, so let the Imperial Government at home adopt modern methods, as Canada and Australia and also the F.M.S. are doing, and call attention to the vast areas awaiting development that they own in the Tropics, which are ready to yield handsome profits to those trained to secure them. All that the Government has to do is to place full facilities to secure the training necessary in the hands of those capable and able to make use of them, and then we shall find the right men go forth to take advantage of such help and that the balance of supply and demand, whether of raw materials or food-stuffs, will, by their efforts and assistance, be better maintained and the present terribly high cost of living and taxation be somewhat abated, as the basis of the supplies is extended and assured.

Agricultural Colleges in the Tropics.

EAST MEETS WEST, AND DISCUSSES THE SUBJECT FULLY.

KNOWING this country to be faced with the problems outlined in the previous article, we were glad to see the large and influential gathering that responded to Sir Robert and Lady Perks's invitation to attend their "At Home," and discuss (1) the necessity of establishing agricultural colleges in the Tropics; (2) why it was necessary to have at least two colleges, one in the East, perhaps Ceylon, and one in the West, probably at Trinidad (W.I.); (3) the scope and possibilities of such colleges when established. The Committee of the Liberal Colonial Club, realizing the importance of securing such colleges,* had approached Mr. H. J.

* See TROPICAL LIFE, July, 1912, p. 132, and especially May, 1912, p. 91, reporting the informal meeting at the publishing offices of TROPICAL LIFE, at which the need of taking action, and of calling the attention of the Government and of M.P.s to the question of the colleges was first discussed.

Tennant, M.P., Parliamentary Secretary to the War Office, and Mrs. Tennant with a view of holding the discussion at their house, knowing their willingness to encourage all such movements. Owing to Mrs. Tennant's illness another rendezvous had to be chosen, and Sir Robert Perks came to the rescue with the most satisfactory results, both to the eye, through the beauty of his rooms and grounds overlooking Kensington Palace Gardens, as well as the mind, through knowing that the discussion had helped forward the movement to a considerable degree. Among those who accepted the invitation, many of whom we noticed as being present, were Lord Blyth, Sir Owen Philipps, M.P., and Lady Philipps, Sir Arthur and Lady Lever, Sir Alexander and Lady Cross, Emily Lady Lawrence and Sir Alexander Lawrence, Sir Crossley and Lady Rayner, Sir Arthur and Lady Downes, Mr. Norman Lamont (ex-M.P. for Buteshire), Professor Morgan, Lord and Lady Swaythling, Sir Albert Spicer, M.P., and Lady Spicer, Sir Felix and Lady Schuster, Sir William and Lady Mitchell, Major Sir Ronald Ross (of mosquito fame), Sir Thomas and Lady Whittaker, Mr. Cecil Beck, M.P. (Treasurer of the Liberal Colonial Club) and Mrs. Beck, Sir Frank Newnes, Sir Edward Rosling and Mr. Norman Grieve (Ceylon), Mr. A. L. Hutchison (*Times of Ceylon*), Sir David MacGregor, Hon. Arthur Sifton (Premier of Alberta), Sir David Brynmor Jones, M.P., and Lady Brynmor Jones, Hon. Dr. Watts (Imperial Commissioner of Agriculture for the West Indies), Mr. William Fawcett (ex-Chief of the Agricultural Department, Jamaica), Mr. Guy Marshall (Imperial Bureau of Entomology), Mr. Victor Hamel Smith, Sir Clifford Cory, M.P., Mr. Ferens, M.P., and Mrs. Ferens, Sir Percy Girouard, Sir Frederick Lugard, Bishop Frodsham (North Queensland), Mr. Cecil Harmsworth, M.P., and Mrs. Harmsworth, Mr. Rowland Barran, M.P., and Mrs. Barran, Mr. Arthur Ashton, K.C., the Editor of TROPICAL LIFE and Miss Hamel Smith, Mr. John Roskill, K.C., Sir Edward Cook (Chairman Liberal Colonial Club), Mr. Robert Christison (formerly of Queensland), Mr. Leicester Harmsworth, M.P., and Mrs. Harmsworth, and many others, about three hundred in all.

Sir Robert Perks briefly introduced Mr. Norman Lamont, whose speech, reproduced further on, started the discussion, which was of a quite informal character, no reporters being present. Needless to say, politics did not find a place therein, those who spoke being of varying opinions. All the speakers had had practical experience in tropical agriculture, Mr. Norman Lamont having a large estate in the West Indies, whilst Sir Edward Rosling and Mr. Norman Grieve are among the most prominent of the Ceylon planting fraternity. Mr. Robert Christison, who has given so generously to the Queensland University, and done so much to encourage and extend agriculture generally in the tropical zone, followed Mr. Lamont, then came Sir Ronald Ross, Sir Edward Rosling, Mr. R. C. Hawkin (Secretary of the Eighty Club), Mr. Norman Grieve, and the Editor of TROPICAL LIFE. All were strongly in favour of establishing at least one college, and two if the money was forthcoming, and as already stated, when the meeting broke up soon after eleven, and the guests adjourned to talk over

the matter in the music salon and refreshment room, their remarks left no doubt that they had much more confidence as to the success of getting the college or colleges established, and that the "At Home" had been of the greatest importance to them, especially following so close on the Ceylon Association meetings. Compared with the public's knowledge of the movement, say six months ago, their education to-day, thanks to these meetings and the help of the press (the *Times*, the *Field*, *Nature*, the *Morning Post*, &c.), has been greatly advanced.

There are those in London to-day who seem confident that the East will get their college; we are glad to hear such news, but at the same time the West Indies must have one as well. Whether Ceylon or Trinidad, the influence and the good to be derived from the colleges will by no means be confined to the comparatively small islands on which they are placed, but will extend far and wide. That for Ceylon (as Kew does at home) can send men to India, Federated Malay States, Straits Settlements, and out to Borneo, the South Seas, and even away to Australasia until they get colleges of their own. If it is so in the East, so it will be in the West, where soil, climate, pests, labour, and other conditions are so different, that the Westerner, to be thoroughly efficient, must be trained on the spot. Here also the influence of his *Agraria et Alma Mater* can make itself felt over a wide area, certainly from Mexico City in the north to Buenos Ayres in the south, an area in which we have "a pretty penny" invested.

This being so, it is well to remember that just now we are in the midst of critical times as regards international expansion in Latin America, and (we are ashamed to say again what we have so often urged) no European nation can afford to stand outside that expansion and expect to be in a leading position a hundred years hence. Any tendency, therefore, to throw cold water on the idea of establishing an agricultural college in the West Indies would sadly handicap not only the chances of the islands themselves to go ahead by attracting capital and men to develop their still latent resources, but, what is far more important, the lack of such a college there would spoil our chances of "coming out top" in South American agriculture and commerce (as we already are in finance) as we can be with the help of our West Indian possessions, especially after the opening of the Panama Canal, once we have the trained men, used to the conditions of soil, climate, and labour in the Western Hemisphere, ready to uphold our interests against other European nations who are used to and trained for agricultural pursuits, far more than ourselves—at present.

If we have £100,000,000 invested in rubber alone out East, besides tea, rice, &c., which in the aggregate must run into a huge sum, this country also has a substantial amount invested in the West, and such investments have increased considerably during the last year or so. The Stock Exchange returns show that at the end of 1912 we had £937,140,450 invested in Latin America, as compared with £814,717,606 at the end of 1911,* and unless we have Englishmen out

in these centres planting and trading, and thereby directing to this country the increased commerce these vast sums are generating, not only shall we lose such benefits, but since they will be called into being by others, *we shall be investing our capital to benefit other European countries*, for the development of South America will only be brought about by Europeans, or the first generation following those who settle there, and not by the Latin Americans themselves. This is a fact accepted by all who know the South American *chez-lui*, and since such is the case, it is well to bear in mind Hiram Bingham's remarks quoted by Mr. James Bryce and included in our December issue, *viz.*: "The well-educated young German who is being sent out to capture South America commercially is a power to be reckoned with. *He is going to damage England more truly than Dreadnoughts or gigantic airships.*"

We feel, therefore, justified in claiming that those who would discourage, much less vote, against the establishment of a college in the West Indies as well as in the East, will be acting against the best interests of this country. We say this because, by not providing a channel to attract and lead young men from these islands or Canada and our other dominions overseas to Latin America, we leave Germany, Italy, and other European countries* free to reap the benefits of the commercial expansion of that continent that should come to us, since it has always been our capital to a large extent, both in the past and in the present, that has made Latin America the magnificent trade centre she is to-day, and will be in a far greater degree in the near future.

Mr. NORMAN LAMONT, in opening the discussion, said:—

Ladies and Gentlemen,—Sir Robert Perks has asked me to say a few words on the "Need for Establishing a School of Tropical Agriculture," and he has asked me to be brief. I shall endeavour to comply with both requests. Let me begin by quoting a paragraph from the Report of the Departmental Committee on Agricultural Education in England and Wales, presided over by Lord Reay.† "For agricultural teachers and experts, a career is opening in this country and abroad, especially in our Colonies and Dependencies. The Universities, in making provision for the training of experts, are doing not only a national but an imperial work. It was stated by one witness that but for the existence of agricultural departments at the Universities of Cambridge and Edinburgh, an Indian Agricultural Department, as now constituted, would have been impossible.

* To say nothing of the Chinese and Japanese, as explained in the leading article last month (pp. 111, 112), entitled "Europe and Asia to meet in Latin America."

† In our issue of October, 1909, p. 167, we called attention to this same Committee before which our Editor gave evidence, when we say: "One of the main points that we have always advanced was accepted by the Committee, which strongly urged that the Board of Agriculture should provide, as is done in other countries, scholarships enabling the holder to undertake post-graduate research, and also travelling fellowships to enable teachers and other suitable persons to study agriculture abroad." (See Report, p. 29, paragraph 103.) In the right hand column against this recommendation are placed the names of three witnesses, Messrs. McCracken, Hamel Smith, and Winter, who advocated this measure.

* The complete list appeared in the *London Chamber of Commerce Journal*.

"Mr. H. S. Lawrence suggested to the Committee the establishment of a Readership in Tropical Agriculture at these Universities. The Committee heartily endorse this proposal. They believe that it would be of considerable advantage to India, the West Indies, and other tropical and sub-tropical colonies."

That proposal, ladies and gentlemen, goes quite as far as the Committee's terms of reference permitted, but by no means so far as the necessities of the case require. There must not only be a Readership in Tropical Agriculture in this country, there must be a College of Tropical Agriculture situated in the Tropics.

This latter proposal is not a new one, but its importance has only become recognized in the last few years. Since the publication of the Report of Lord Reay's Committee much has happened. The rubber boom has happened. Since January 1st, besides several letters, there have been no less than three leading articles in the *Times* upon this subject; while the *Morning Post*, the *Field*, *Nature*, and other influential organs have dealt with it, editorially or otherwise. In the Colonies themselves it is creating not only interest but enthusiasm, as we may see from their newspapers and from the debates and discussions of their agricultural societies.

Why is there this increased interest in the question? It has long been recognized in temperate climes that skill and science are more and more necessary in agriculture; but the rich virgin soils of the Tropics, their perpetual summer, and their cheap labour, have enabled their crops to be grown so easily, and harvested so profitably, that the idea became prevalent that skill and science were altogether superfluous. But now that soils are getting tired, if not exhausted, that prices are falling, that substitutes are being invented, and that vast new areas are being rendered available for cultivation by railway extension, and other improvements in means of communication, and thanks to the work of the schools of tropical medicine, it is seen that science is imperative, that the most highly skilled and trained men must be employed, to enable the last ounce of produce to be extracted from the soil, if cultivation is to continue profitable.

In the sugar industry this has for some time been obvious. In the rubber industry it has recently been brought home to a host of new and puzzled directors, themselves not precisely experts in tropical agriculture, by the very great difficulty of obtaining trained men as managers and assistants on their plantations. I heard of one plantation recently where the last three agricultural assistants sent out had qualified respectively in an engineering shop, a printer's establishment, and a shipbuilding yard. But it is only fair to say that, with the adaptability characteristic of my Scottish compatriots, all three young gentlemen are reported to be doing well. Nevertheless, the fact connotes a certain waste of energy, or at least a certain misdirection of effort.

But facilities for education in tropical agriculture are needed not only for the maintenance of the sordid, necessary dividend, but for the advance of knowledge. A Tropical Research Station would be of great assistance to Universities here, for it would react very favourably on research work at home, and most valuable new facilities would be afforded to post-graduate workers, especially in the three important subjects of botany, entomology, and mycology. Furthermore,

the interchange of teachers and students would certainly stimulate ideas.

Again, new careers are opening out in these three subjects for experts, specialists, advisers, inspectors, and instructors under the departments of agriculture which are being established or enlarged by all our tropical Colonies. At present the young men of the better class in those Colonies seek their fortunes far too largely in the two professions of law and medicine. Our institution would give them a new chance of shaping a career interesting and remunerative, and at the same time full of work important to the future of their native land and helpful to the trade of the Empire at large.

So much for the need for the college; now a few words as to its scope. This has been so thoroughly argued in a brilliant article in *Nature*, over the well-known initials J.B.F. (J. B. Farmer), that the discussion on this point may be regarded as closed. The institution must be an Agricultural College of University rank. A full-blown University would be too costly, too ambitious. Some of its departments would certainly be starved, and its general prestige lowered in consequence. Besides, needs, other than agricultural, can be met in existing institutions, either in the Colonies or here. A mere agricultural college, on the other hand, would doubtless be cheaper, and might satisfy local requirements and the desires of the planters; but it would do so at the cost of its usefulness to the Mother Country.

To be successful, it is essential that the proposed institution should enlist the sympathy and support of Cambridge, Edinburgh, Reading, Kew. Its object must not be merely to *spread* knowledge, but to *increase* it. It must provide facilities, therefore, not only for teaching, but research. Our College must include a tropical research station for students from the United Kingdom to study tropical problems on the spot.

On the spot! What spot? This is a thorny question.

The British Empire undoubtedly contains many suitable spots, but it seems to me that, above all others, two localities stand out pre-eminent. In size, wealth, population, healthiness of climate, and variety of cultivation, as well as in their central situation, no other colonies appear so suitable as the two great and fertile islands of Ceylon and Trinidad. As between these two, I cannot attempt to decide. I can make no claim to impartiality, and I have never visited Ceylon. But surely in the Empire there is room for two such institutions! And I do say this, that if the College, or if one of two such Colleges, is to be situated in the West Indies, then the fact of the existence of the Imperial Department of Agriculture will be of enormous advantage.

The Imperial Department is situated in the island of Barbados, and, if I may say so in the presence of Dr. Watts, its work in Barbados is done. Neither in soil nor in climate is Barbados typical of the other West Indian Colonies, and it is no longer the junction of the various steamer services. If, then, the Imperial Department were transferred from Barbados to Trinidad, you would renew its usefulness, you would enlarge its field, and you would lay the foundations, and lay them firm, of a Tropical College of Agriculture which would be of service to our whole Empire.

PLEASURE AND PAIN IN THE TROPICS.

Mr. AUSTEN CHAMBERLAIN'S **APPEAL** for £100,000.

We again appeal to all our readers to put aside a small percentage of their income during the past twelve months and remit it to Mr. Austen Chamberlain (9, Egerton Place, London, W.), in order to try and raise £25,000 out of the £100,000 needed for the work of the London School of Tropical Medicine in the Tropics, so that the lives and health of their families and friends, as well as of themselves, can be assured, and that, whilst they continue to grow rich and can make merry, others who are less fortunate shall not be forgotten.

If life in the Tropics to-day has become bearable and pleasant for Europeans, and if vast new areas can be utilized to-day which formerly were closed to "white" capital and enterprise, this is largely due to the Liverpool and London Schools of Tropical Medicine. Yet in spite of this, Mr. Austen Chamberlain's appeal to raise £100,000, to place the London School of Tropical Medicine on a sound basis, and extend its work, has only resulted so far in £63,000 being raised.

In the course of his lecture on "Medical Science and the Tropics," at the Royal Colonial Institute, on January 14th, Major Sir RONALD ROSS, K.C.B., M.D., F.R.S., told his audience: "Britain probably gives much less than £50,000 per annum throughout the British Empire for Medical Research which benefits 50,000,000 white people, not to mention hundreds of millions of coloured subjects. This sum divided amongst the white subjects only amounts to **one-tenth of a Penny** each per annum. We spend every day on public banquets many times more than this sum, but if the work of investigation is to continue it must be properly paid for by the country, and the Colonies ought to contribute more than they do. Those that go abroad are above the average, since they have the ambition to go and ability to prosper when they get there."

Cotton.

THE following were the prices for Cotton in London on July 11th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.	Fine.	Superfine.	Good, 1912.		Compare Good, 1911.		per lb.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	
Surat kinds*	5½	to 5½	5½	6	—	5½	to 6½	6½	to 6½	—
Madras ...	5½	to 6½	5½	—	—	5½	to 6½	6½	to 7½	—
Bengal ...	—	—	5½	5½	5½	5½	—	5½	—	—
Assam ...	—	—	5½	5½	6	6	—	6½	—	—
China ...	—	—	5½	5½	6½	6	—	6½	—	—
West Indian ...	7	—	7½	8	8½	7½	—	8½	—	—
Sea Island ...	12½	—	15	18½	22	14	—	14	—	—
West African ...	5½	—	6½	6½	—	7½	—	7½	—	—
East ,, ...	6½	—	7½	9½	—	7½	—	8½	—	—

* Liverpool quotations.

There has been a steady demand on the spot this week, ending July 12th, but business in "Futures" continues dull, awaiting further developments as to crop and the general financial position. Prices show a rise of 4½ to 5½ points up for old and 3 for new crop deliveries. East Indian is neglected, and prices are unchanged to somewhat lower. Silver remains unchanged at 26½d. per oz.

The import into Liverpool this week amounts to 6,545 bales, since September 1st 4,466,338, same week last year 25,182, last year's total 4,968,744 bales. The estimated Sales amount to 55,000 bales, including "called." Middling American is quoted at 6·76d. per lb., last year 7·09d., 1911, 7·73d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.
Brought into sight ...	13,374,000	15,558,000	11,632,000
Exports from United States since September 1st—			
To Great Britain ...	3,493,000	4,145,000	3,270,000
To Continent, &c. ...	4,391,000	5,548,000	3,920,000
Total crop ...	—	16,138,000	12,120,000

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	July 10th.	Same time 1912.	Same time 1911.
July ...	6·48½	6·85½	7·47 per lb.
July—Aug. ...	6·48	6·85	7·42½ —
Aug.—Sept. ...	6·40½	6·80½	7·19 —

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

A GENERALLY dull tone has prevailed in this market and a large proportion of the Central American kinds offered at auction during the week ending July 10th were bought in; where sold, easier prices were accepted in most directions, especially for the lower grades. "Futures" opened weak and lower and the market has since been dominated by the financial position accentuated by a failure in America. September Santos was done down to 40s., but later there was some recovery; prices, however, were not maintained and at the close September was quoted at 40s. 6d. We quote:—

	To-day	July 3rd, 1913
London ... Santos, Sept. del. ...	40s. 6d.	45s. 0d.
New York ... No. 7 Rio ,, ...	8.47 cents	9.40 cents
Hamburg ... Santos ,, ...	45½ pf.	49½ pf.
Havre ... Santos ,, ...	57 francs	61½ francs

The receipts at Rio and Santos for the crop season 1912-13 were 11,485,000 bags, against 12,464,000 bags, and 10,548,000 bags in the two previous seasons respectively.

Sales include the following, viz.:—

East India.—Neilgherry, &c., 60s. to 67s. for smalls, 67s. to 75s. for second size, 70s. 6d. to 75s. 6d. for bold. Travancore, 65s. 6d. for smalls.

Nairobi.—At 61s. to 68s. 6d. per cwt.

Costa Rica.—At 53s. to 56s. for smalls, 54s. 6d. to 55s. for ordinary, 73s. 6d. for good middling, 72s. to 78s. 6d. for bold.

Guatemala.—At 52s. to 61s. for ordinary to fair smalls, 63s. to 71s. for fine fine ordinary to good middling, 69s. to 75s. for bold, 88s. for Maragogipe.

Salvador.—At 54s. 6d. for foxy green, 59s. 6d. to 63s. for fine ordinary to middling.

Nicaragua.—At 53s. 6d. for foxy green, 67s. to 69s. 6d. for good middling, 62s. 6d. for ordinary bold, 78s. to 81s. for fine bold.

Vera Paz.—At 63s. to 68s. for good smalls, 60s. to 67s. for fine ordinary to middling, 74s. for good middling, 77s. to 82s. 6d. for bold, 10½s. 6d. for fine green Maragogipe.

Mexican.—At 52s. to 58s. for ordinary to good ordinary, 66s. for middling, 74s. to 76s. for bold, 83s. for Maragogipe.

Colombian, &c.—At 64s. 6d. for smalls, 64s. 6d. to 65s. 6d. for low middling, 63s. to 76s. 6d. for ordinary to good bold.

Sugar.

MR. C. CZARNIKOW, writing on July 10th, told us that owing to further rains on the Continent, which seem to have satisfied farmers for the present, we had a rather easier tendency this week, August declining from 9s. 4½d. to 9s. 3d., October-December from 9s. 7½d. to 9s. 5½d., closing at 9s. 3½d. and 9s. 6d. respectively. Holders did not get influenced much by a rise in America from 3.48 to 3.54 cents, or even 3.57 cents, according to shipment, equal to 10s. 0½d. to 10s. 3d. c.i.f. United States, whilst the value in Europe is about 9s. 7½d. c.i.f. It has facilitated the resale to United States of several Cuban cargoes owned here, and consequently our imports here may be reduced to a moderate extent; but for all that, European holders feel that there will be sufficient sugar on the market if the new crop promises well, as it does at present. Our prices, however, are moderate, and as the weather is generally "too something," either dry or wet or hot or cold, it seems hardly advisable to get unduly depressed at 9s. 6d. for October-December, even if this means more than 10s. for next summer delivery. Java prices are easier this week.

In America some offerings of Californian beet crystals in Chicago for July delivery were not sufficient to prevent the above improvement, and if Cuba holds her sugars now, there is nothing to compete with them for Atlantic meltings, even at 3.57 cents or 10s. 3d. c.i.f. = 8s. 9d. c.i.f. Javas, and 7s. 9d. f.o.b. 88 per cent. Hamburg. Our market therefore is right in not over-estimating the American improvement.

Business in refining grades of cane sugar in the United Kingdom has again been upon a very limited scale, values remaining about unchanged. Grocery crystallized has sold in moderate quantities at previous rates.

As regards cane-growing countries, mail advices from Louisiana report excellent weather, and a large crop is expected. In Formosa the weather continues propitious, with timely rainfall. Should no typhoon occur, the crop is expected to reach about 155,000 tons Centrifugal and 30,000 tons molasses sugar, as compared with 101,000 tons in 1912-13, 173,000 tons in 1911-12, and 267,000 tons in 1910-11.*

The total transactions of British West India for the week amounted to about 3,500 bags. Crystallized Demerara, middling greyish yellow, 14s. 3d. to 14s. 6d. duty paid; middling yellow, 14s. 7½d.; Syrups (31 bags), strong brownish yellow, 12s. 3d. Crystallized Trinidad, good middling yellow, 14s. 7½d. to 14s. 9d.; fine yellow, 15s. 9d.; fine pale, 16s. Crystallized Jamaica, middling yellow, 14s. 9d. Crystallized St. Lucia, good palish, 15s. to 15s. 3d. Barbados Muscovado (499 bags), good soft yellowish, 14s. 9d. to 14s. 10½d.; and some Guatemala Syrups offered at auction sold at 11s. 3d. duty paid.

Up in Liverpool 3,000 bags Peruvian Syrups sold at 8s. 3d. to 9s. 6d. ex quay, and 150 tons afloat at 8s. 3d. floating, landing, Clyde, basis 89 per cent. polarization, 1,200 bags semi-grainy at 10s. quay.

Coco-nut Products, &c.

MESSRS. MORDAUNT BROS. report that Ceylon coco-nut oil was largely dealt in in mid-June at 43s. 3d. to 43s. 9d. c.i.f., the month ending with a further advance of 6d. to 1s. per cwt., with a scarcity of supplies. July opened with sellers at 47s. 6d. for Cochin, and at 43s. 9d. to 44s. 9d. for Ceylon, but such prices were checking business and very little was done until the second week in July, when the oil was again in active demand, in spite of further rises of 5s. to 10s., with quotations (somewhat nominal at 48s. 6d. for Cochin and 44s. 6d. to 45s. 6d. for Ceylon). Pressed oil, on July 12th, stood at 42s. 6d., and palm kernel oil at 43s. 9d. to 45s. 3d. f.o.b. Hamburg.

Prices generally, on July 12th, ran as follows:—

<i>Palm oil (Liverpool):</i>		1913	1912	1911
Per cwt.				
Lagos	... 32s. 6d. to 32s. 9d.		28s. 9d.	30s. to 30s. 6d.
Benin	... 30s. 3d. to 30s. 6d.		27s. 3d.	29s. 3d.
Congo	... 26s. 9d. to 27s. 3d.		26s. 9d.	26s.
Bleached	... 34s. to 35s. 6d.		30s. 6d. to 31s. 6d.	32s. 9d.
Clarified	... 30s. to 31s.		27s. 6d. to 28s.	29s.
<i>Palm kernel oil</i>	45s. 3d. to 47s.		35s. 6d. to 38s.	35s. to 37s.
<i>Coco-nut oil:</i>				
Cochin	... 54s.		43s. 6d.	41s. to 42s.
Ceylon	... 48s.		38s.	39s. to 40s.
English pressed	None		34s. 6d. to 35s.	37s. 6d.
<i>Copra oil:</i>				
Ceylon	... None		38s. 6d. to 39s.	39s.
Cochin	... 50s. 6d.		41s. 3d. to 42s.	41s. 6d.

According to the *Public Ledger* of July 12th, prices ruled as under (per ton):—

Soya Oil Beans.—Parcels Harbin spot Hull, £8 10s.; afloat, £8 8s. 9d.

Linseed Cakes.—London made, £7 10s. to £7 12s. 6d.

Cotton Cakes.—London made, £5 12s. 6d. to £5 15s.

Copra quieter. Malabar, August-October, £31 17s. 6d., sellers Hamburg; Ceylon, June-July, £31 10s., value Hamburg. Java, April-June, £30 17s. 6d. sellers; May-July, £30 done; July-September, £29 10s. sellers; and August-October, £29 7s. 6d. Holland, Hamburg and Bremen. Macassar, May-June, £30 7s. 6d. value; and June-July, £29 15s. sellers, Holland, Hamburg and Bremen. Singapore, June-July, £30 value; and July-August, £29 17s. 6d. sellers, Hamburg. Cebu, June-July, £29 15s. paid, Hamburg. South Sea Island, July-August, £29 12s. 6d. buyers London. F.M. Straits, July-August, £29 5s., value Marseilles. Manila, April-June, £29 2s. 6d. sellers, and July-September, £28 7s. 6d. done Marseilles. Mixed no Padang, April-June, £28 17s. 6d. sellers, and June-July, £28 15s., Holland, Hamburg and Bremen, all c.f. and i., delivered weight.

Soya Oil.—Hull, Naked Extracted spot, £27; July-December, £26 15s. Oriental strong at a further advance; May-June, £25 15s.; June-July, £25 15s.; July-August, £25 10s. paid for several thousand cases c.i.f. Antwerp, closing £25 15s., £25 17s. 6d.

Coco-nut Oil.—Ceylon spot, £48; June-July, £45 10s. c.i.f.; July-August, £45 c.i.f. Cochin spot, £54; August-September, £48 15s. c.i.f. The U.S.A. have been buying in some quantity. Ceylon, afloat, £46 to £46 5s.; May-June, £45 15s.; June-July, £45

* We are including an article in our August number by Mr. Sadao Yadama, in which we discuss the Formosan sugar output and the causes of its irregular output.

7s. 6d.; July-August, £45; August-September, £44 10s. to £44 15s.; September-December, £44 12s. 6d., all on c.i.f. terms. Spot ex wharf, £48 to £49. Cochin is purely nominal, August-September, £48 c.i.f. Spot, £52 in pipes, £54 in hogshead. Pressed is also in very good demand. July is held for £44 10s.; early August, £44; September-December, £42 10s. to £42 15s.

Palm Oil.—Lagos on spot, £35.

Palm Kernel Oil.—July, £44 10s.; August, £44 5s.; July-December, £43 5s. f.o.b. Hamburg.

The market for coir goods is displaying a quiet tone, but for both Cochin and Ceylon yarns there were high limits placed, and in consequence sales were limited.

The India-rubber Market.

FINE hard quiet, but still 3s. 9½d. to 3s. 10d., against 2s. 11½d. top price for Plantation. At the sales on July 1st and 2nd, reported Messrs. S. Figgis and Co., 452 tons Eastern Plantation rubber were offered, and prices were rather irregular, but the average decline was about 1d. per lb. below the close of the previous sales. Latex Crêpe declined about 1½d. per lb., but "off" quality sheets and dark Crêpes sold steadily.

Latex Crêpe now 2s. 10¼d.; hard fine Pará quiet, 3s. 9½d. to 3s. 10d.; soft fine, 3s. 5d., and Caucho Ball, 2s. 3d.

The sales included:—

Malaya.—Crêpe, fair to fine pale, dull to good palish, 2s. 10¼d. to 2s. 11¼d.; light brown and grey, part streaky, 2s. 8d. to 2s. 10¼d.; fair to good clean brown, 2s. 4¼d. to 2s. 8¾d.; dark and specky brown, 2s. 0¼d. to 2s. 5½d.; dark and black, part pressed, 1s. 11d. to 2s. 3½d.; dark and black, inferior, 1s. 4¾d. to 1s. 10½d.; dark to good smoked, 2s. 5½d. to 2s. 9¼d.; cured by "Byrne" process, nothing offered. Sheets, fair to very fine smoked, 2s. 10¼d. to 2s. 11¾d.; damp, mouldy, and part smoked, 2s. 8d. to 2s. 10d.; fair to fine unsmoked, 2s. 10¼d. to 2s. 11d.; damp, mouldy, and stuck, 2s. 8¼d. to 2s. 10d. Block, fine pale Lanadron, nothing offered. Scrap and Virgin, fair to good, 2s. to 2s. 5d.; mixed and inferior, 1s. 6d. to 1s. 11½d. Rambong, Crêpe, 2s. 1¾d. to 2s. 6d.; scrap and block, nothing offered. Castilloa, sheet, 1s. 11d. to 2s. 3d.

Ceylon.—Crêpe, thick dull to fine, 2s. 10¼d. to 2s. 11½d.; fair to fine pale, dull to good palish, 2s. 10¼d. to 2s. 11d.; light brown and grey, part streaky, 2s. 8½d. to 2s. 10¼d.; fair to good clean brown, 2s. 5d. to 2s. 8¼d.; dark and specky brown, 2s. 1½d. to 2s. 6d.; dark and black, part pressed, 2s. to 2s. 3d.; dark to good smoked, 2s. 4½d. to 2s. 8¾d. Sheets, fair to good smoked, 2s. 10½d. to 2s. 11½d. Sheets and Biscuits, fair to good unsmoked, 2s. 10¼d. to 2s. 11d.; damp, mouldy and stuck, 2s. 8¼d. to 2s. 10d. Scrap and cuttings, fair to fine, 2s. to 2s. 3d.; mixed and inferior, 9d. to 1s. 11d.

At the auctions on July 15th to 17th 670 tons of Eastern Plantation were offered and prices went 1d. per lb. higher than last week's private market, say, Latex Crêpe, 2s. 9½d.; Hard Fine Pará, 3s. 9½d. to 3s. 10d.; Soft Fine, 3s. 3½d.; and Caucho Ball, 2s. 2d. Malay Plantation, cured by "Byrne" Process, dark brown to good, 2s. 4½d. to 3s.

With regard to the reasons set forth in various quarters for the discrepancy between the prices of Pará and Plantation rubber, the report of Messrs. Clayton, Beadle and Stevens provides interesting reading. Summing up the result of their researches, it would seem that there is very little difference in the qualities of the two products, at any rate by no means sufficient to warrant a premium of about 1s. per lb. in favour of Pará. While we must admit that other experts have expressed rather different views from those of Messrs. Clayton, Beadle and Stevens, we think that, with the efforts now being made to improve the manufacture and sale conditions, the price of Plantation rubber should sooner or later be restored to something like an equality with that of Hard Fine Pará.

Pará rubber statistics for the month of June (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará ...	1,280	820 =	2,100 agst.	2,570	1,720	1,200
Shipments to Europe	590	450 =	1,040	1,870	1,320	1,240
„ „ America	490	320 =	810	1,170	920	480

Crop statistics, June 30th, 1912, to June 30th, 1913 (12 months):—

		Pará.	Caucho.	1912-13.	1911-12.	1910-11.	1909-10.	1908-9.
Pará {	1912-13	32,290	9,660	41,950	39,360	37,500	39,130	38,090
Receipts {	1911-12	30,230	7,130					
„ Ships.	Europe	17,050	6,720	23,770	20,260	19,910	21,860	19,200
„ „	America	16,230	3,300	19,530	20,570	13,570	17,040	19,050

The London Cocoa Market.

By THE EDITOR.

At the public cocoa sales on July 8th, reference was made to the death on the previous day of Mr. James Storrs Fry, in his 87th year. The deceased, who never married, became head of the firm of Messrs. J. S. Fry and Sons, Ltd., in 1886, on the death of Mr. Francis Fry, F.S.A. (grandson of the founder), under whose guidance the business of the firm expanded so wonderfully, and the house attracted world-wide fame. It has been claimed that cocoa is conducive to health and long life; those who believe so can certainly point to the heads of the firm of Fry as examples, for I take it they were all regular consumers of this "Food of the Gods." Reigned over by the founder, Mr. Joseph Fry, from its start in 1728 until 1787, the house then had as its head for a time Mrs. Anna Fry, widow of the founder; then came the first Joseph Storrs Fry, who died in 1835, followed by his son, Mr. Francis Fry, then the gentleman whose loss is now so widely deplored. Even in Bristol, noted for its benevolent citizens and many charities, the Mr. James Storrs Fry who has just died undoubtedly held a foremost place for the large-hearted and unassuming kindnesses he spread around him, so that if he was justly called "The Father of his Firm," it was equally appropriate to describe him as "The Father of Bristol." When visiting that city in 1901, Mr. Claud Fry introduced me to the head of the firm, and we discussed cocoa and its production and shipment at some considerable length, for, in spite of the disparity in our ages, we both knew many of the West Indian shippers, and especially old Mr. Charles Fabien, who used to ship the firm large quantities of cocoa, and stay with members of the family when in Bristol.

Coming to market news, this, I think, can best be described as being undecided; for all that I do not think it will go lower just yet, I do not see why it should. If the Gold Coast output has increased, other centres, Trinidad, Grenada, Bahia, San Thomé, &c., have continued to go back, in some cases to a most disappointing degree, especially from the planter's point of view, for with increased areas under cacao the exports should have been as much in advance as they are behind; if exports have not been less, that does not say that some planters have not, in comparison, done very badly. Lately, however, rains have set in, and so if the owners have been unable to save or make up what should have been current pickings, and that is impossible, they are hoping to get the new crops in earlier, and secure larger supplies from November on. If the rains continue the crops will benefit greatly, in many cases they have done so already, and after their rest the trees certainly should try and make up for lost time and crops, as the number of pods that got checked and lost during the drought must have been enormous. Certainly, one must hope that with all that is said in favour of mulching and cultivation between the trees to preserve the moisture, something can be done to assure even outputs in time of drought to a far greater extent than exists to-day, when the only certainty is that you will have a bad crop. According to the latest figures available, producing centres have yielded the following:—

			1912-13. Bags.	1911-12. Bags.	1910-11. Bags.
Trinidad ...	Oct. 1st—June 23rd		192,610	198,397	216,789
Grenada ...	„ „		58,570	67,043	61,814
			1913 Qtls.	1912 Qtls.	1911 Qtls.
Guayaquil ...	Jan.—mid. July		362,800	505,200	473,300
			Bags.	Bags.	Bags.
San Thomé (Lisbon)	Jan.—June		214,592	228,961	225,563
Bahia } Receipts	Jan.—May ...		91,495	121,696	223,475
Exports	„ „		128,334	211,407	235,567
			Tons.	Tons.	Tons.
Gold Coast*	„ „		23,207	16,628	16,889

* "Gordian" figures (tons = 1,000 kilos.).

Coming to consumption, the latest particulars to hand show the following deliveries for consumption, by which it will be seen we are behind last year:—

			1913. Tons.	1912. Tons.	1911. Tons.
January—May					
Germany ...	...	...	22,175	25,661	23,341
Holland ...	...	...	14,604	12,477	9,359
U.K. ...	...	...	12,447	11,761	9,671
France ...	...	...	10,537	10,600	10,732
Belgium ...	...	...	2,280	3,020	2,307
			62,043	63,519	55,410
Add U.S.A.—Jan.-April	...	...	27,954	28,760	27,637
Gives comparative totals	...	...	89,997	92,279	83,047

Coming to the United Kingdom alone, the Board of Trade figures to the end of June show that our deliveries of raw cocoa for home consumption in June were only two tons above last year (1,832 tons, against 1,830 last year, and 1,930 tons in 1911); but whilst they showed this small increase, foreign manufactured sprinted on another 119 tons in the month, so that if the deliveries of raw cocoa for January-June, *i.e.*, cocoa to be made up in England, is only 687 tons ahead of last year, foreign manufactured has shot 1,053 tons beyond the 4,587 delivered during January-June, 1912, say:—

Raw Cocoa only—	Landed.	Del'd H.C.	Exported.	Stock (June 30th)
Jan.-June, 1911—	20,494	11,601	2,956	15,494 tons
„ „ 1912—	18,993	13,592	2,972	11,930 „
„ „ 1913—	20,072	14,279	3,832	11,213 „
	Incr. 1,079	Incr. 687	Incr. 860	Decr. 717 „

Foreign Manufactured—	Landed.	Del'd H.C.	Landed.	Del'd H.C.
	June only.		Jan.-June.	
1913—	834 ...	725 ...	5,897 ...	5,640 tons
1912—	628 ...	606 ...	4,415 ...	4,587 „
1911—	590 ...	523 ...	3,777 ...	3,362 „

Coming to stocks, it will be noted by the following that Havre increased hers by some 15,000 bags, mainly on account of the landings of Spanish main cocoa having exceeded the deliveries by that quantity (19,629 bags landed, 4,678 delivered); here are the figures:—

Havre Stock, June 30th—	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
Pará ...	14,439	82 to 86	6,329	78 to 80
Bahia ...	10,949	81 „ 86	8,607	72 „ 78
Venezuela ...	57,157	86 „ 185	53,747	79 „ 200
Trinidad ...	26,480	87 „ 90	35,902	82 „ 86
Grenada and O.W.I.	3,200	79 „ 87	5,973	68 „ 80
San Thomé ...	5,085	86 „ 83	6,949	74 „ 76
San Domingo ...	4,061	75 „ 80	8,554	68 „ 71
Haiti ...	6,935	70 „ 82	9,322	60 „ 72
Accra ...	56,487	77 „ 80	59,713	71 „ 73
Guayaquil ...	17,669	90 „ 96	18,284	72 „ 83
Others ...	12,524	—	7,543	—
Totals ..	214,986 bags		220,923 bags	

London Stock, July 12th—	1913. Bags.	1912. Bags.
Trinidads ...	10,362	6,941
Grenadas ...	7,809	5,059
Other W.I. ...	4,080	9,194
British Africa ...	11,452	8,181
Portuguese Africa ...	4,764	4,670
German Africa ...	4,013	7,002
Ceylon and Java ...	18,401	16,545
Guayaquil ...	12,158	41,735
Brazil and Bahia ...	604	2,455
Other Foreign ...	7,747	7,284
Totals ...	81,390	109,066

San Thomé movements at Lisbon during June ran as follows:—

			Bags.
Stock at Lisbon, May 31st	...	...	58,655
Landed in May	...	...	29,183
		Gives ...	87,838
Less deliveries in May	...	...	25,350
Leaves stock on June 30th, 1913	...	...	62,488
Against „ „ 1912	...	...	95,022

I am very glad to see that Sir George Watt, C.I.E., &c., formerly reporter on economic products to the Government of India, and author of such standard works as "Economic Products of India," "Wild and Cultivated Cotton Crops of the World," "Pests and Blight of the Tea Plant," &c., &c., thinks well of the book about to be issued by TROPICAL LIFE Publishing Department on the "Fermentation of Cacao." In acknowledging a complete set of proofs sent him, Sir George said: "Your letter and the proofs of your great work on the 'Fermentation of Cacao' duly came to hand. I have read every word with absorbing interest, and must congratulate you on being able to bring out a work that will become a classic on the subject it deals with so very ably."

The publishers are, very naturally, gratified at receiving such a recommendation from so experienced an authority, and feel sure that the essayists (Dr. Axel Preyer, Dr. Fickendey, Dr. Sack, Dr. Schulte im Hofe, Mr. George Hudson, and Dr. Lucius Nicholls) will be equally pleased.

Coming now to market values, these at the time of going to press, July 16th, were supposed to be going lower, but I do not trust the downward tendency, if such a thing does exist, as being too stable, for manufacturers must still be drawing on stocks rather than laying them up, and until we get the end-of-the-year receipts, and that, too, on a liberal basis, I do not quite see where they can possibly expect the substantial landings to come from that are necessary both for here and on the Continent to pull 10s. or 15s. per cwt. off the price of Grenadas and similar cocoas, especially in face of the continued excess of exports over receipts from Bahia. One queries at times how this centre can go on, month after month, sending out so much more cocoa than she is said to be receiving. Until supplies generally increase there is not much chance of manufacturers buying to lay up; at the moment they seem to be buying entirely from hand to mouth. Including public and private sales up to July 16th prices run as follows:—

Trinidads.—Good red, 74s.; fine marks, 77s.; mid red is valued at 71s. to 72s.; good mid to fine good red, 73s. to 76s.

Grenadas.—Fine is valued just now at only 70s., against sales last month, first at 73s. and then at 72s. Latterly transactions have included some quantity of second-hand cocoa which was sold cheap, causing prices realized to be somewhat unreliable. Common unfermented to fair fermented has been selling at 66s. to 68s.

Jamaicas, after selling at 70s. and 71s. 6d. for good to fine fermented, and 64s. to 69s. for low unfermented to fair fermented, are now rather easier at 68s. to 70s. for the best, and 62s. to 64s. for low unfermented.

St. Lucia.—The best marks last sold at 72s. down to 70s., against 72s. to 73s. at the end of June, whilst common unfermented to fair fermented are worth 66s. to 68s.

Dominica sold at the end of June at 73s. for a lot of fine, and good red at 70s. 6d., ordinary to fair fermented 67s. 6d. to 69s. Fine now cannot be valued at over 70s.

Costa Rica.—Good reddish has been selling at 70s., and fine at 73s., but now buyers talk of 68s. to 70s.

West Coast, Africa.—In London very little business is reported, and Accra kinds are valued at 61s. to 63s. or 64s.; up at Liverpool sales have ranged from 60s. up to 63s.

Samoa.—Middling to fine sold at 74s. to 80s.

Java.—Fine bold realized 96s.

Venezuelan.—Fine Puerto Cabello sold at 112s. 6d. for fine clayed.

Colombian.—Fine bold changed hands at 115s.

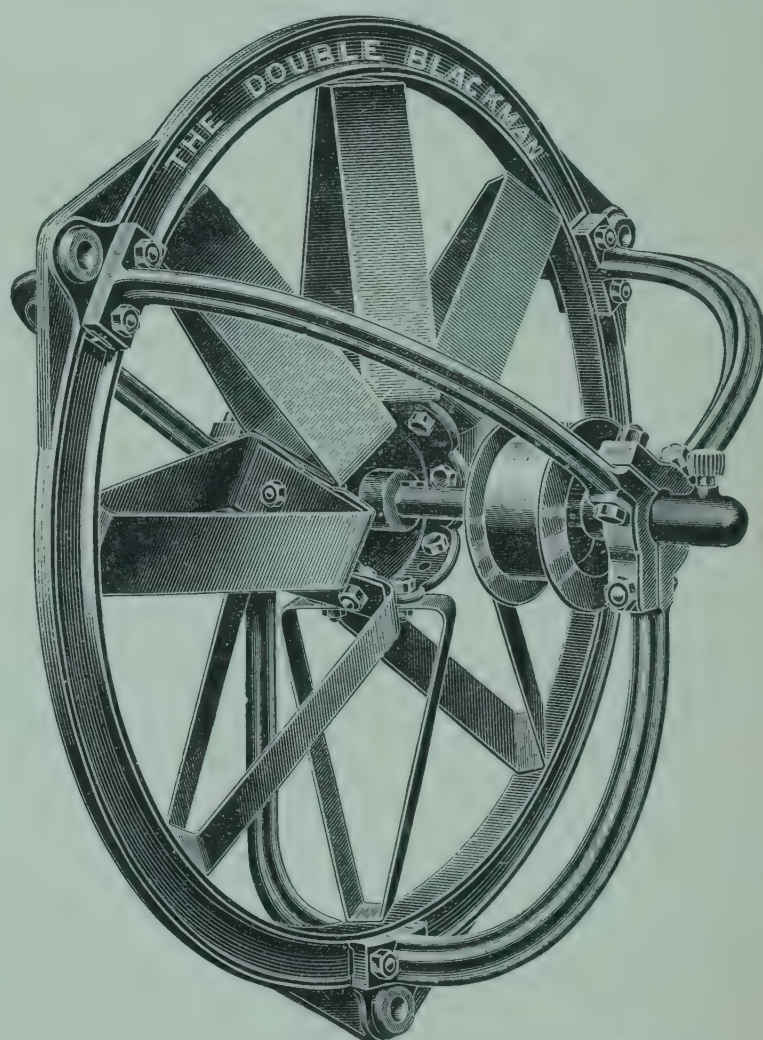
Guayaquils.—Caraquez have been selling at 74s. to 75s., and Arriba at 79s.

Ceylons have gone higher; good to fine bold estate sold first at 88s. to 92s., medium at 83s.

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A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. IX.—No. 8.]

AUGUST, 1913.

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Our Book on "The Fermentation of Cacao."

ORDERS are now coming in for the above book, the final pages of which were printed off during the second week in August. The first batch of books, at the time of going to press, was at the binders, so those awaiting their copies can expect to receive them by the same mail that brings this paper across or the one after. Those who have not yet sent in their orders should do so at once, with remittance, 11s., including postage, or 10s. net. There are 416 pages from cover to cover, with 35 illustrations. Orders have been received from all parts of the world, including Ecuador, Papua, Rio, the West Indies; and some of our friends, when ordering their copies, have taken away rough proofs to read on the voyage out, so anxious are they to study the contents whilst they have plenty of time to do so. All expressed surprise at the size of the book, which they thought would have been quite small in comparison, and agree with Sir George Watt's "Foreword," where he says that the book will become a classic on the subject of the preparation of cacao beans for market, and future investigators into this important matter will require to make use of it.

Copra Notes.

THE *Times of Ceylon* some little time back published the account of an interesting interview with Mr. R. P. Doudney, the well-known manager and visiting agent of the Mylambavelly group of coco-nut estates at Batticaloa (Ceylon). In the opinion of this authority, the present high price of copra is undoubtedly due to an increasing demand for lubricants, and also to the fact that the world is becoming cleaner as it becomes more civilized, and this is increasing the demand for soap, and he sees no reason to anticipate a fall in the price; if, however, the huge tracts of land in the Straits, Java, and elsewhere, at present undeveloped, were planted in coco-nuts and began to send out produce the market might be affected, but it would be a steadying effect, not necessarily a weakening one. Discussing direct trading, Mr. Doudney very rightly pointed out that it did not pay to ship copra direct from the estates to the actual consumers; such parcels were usually too small to realize full prices. It was better to sell to the local dealers any parcels less than 100 tons, and certainly if less than 50 tons. This advice we can fully confirm, as we consider that 100 tons of copra is the advisable limit in size to ship. Send parcels as much larger as you can, but not smaller; if you do you will make a mistake, for you draw only the small bidders, your parcel not being worth the attention of the large buyers.

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Rubber-planting in Davao (P.I.).

THE QUESTION OF THE VARIETY OF THE CASTILLOAS IN CEYLON.

ACCORDING to the *Mindanao Herald*, it is not unlikely that the fame which the Davao District has acquired throughout the Philippines from its large hemp fields will in future be eclipsed by its rubber yields. What is more surprising is that the *Castilloa* (known as Panama) rubber, rather than Pará, is attracting attention because of its very rapid growth, the high grade rubber obtained from the young trees,* and the richness of the latex in rubber globules.

Six years ago, i.e., in 1907, *Castilloa* rubber was planted at various places in the district. Mr. H. S. Peabody made a considerable planting at Lais, and a few seeds were planted on the Padada River by Mr. McClellan.

At both places the rubber trees have now developed into large ones, many of them being 45 in. and more in circumference 3 ft. from the ground. A few months ago experimental tappings were made of the trees at Lais, and Mr. O. V. Wood delivered the rubber to the Goodrich Rubber Co. in the United States. They reported on the quality as being of high grade, and, though the samples contained 8 per cent. bark due to crude methods of tapping, they were valued at 90 cents U.S. currency per pound, against \$1.05 for Pará, and the Goodrich people were incredulous about such high grade rubber coming from *Castilloa elastica* trees of five years of age.

They were, however, sufficiently interested in the matter to send a rubber expert, Mr. W. T. Easley, to Davao, to examine the trees, make experimental tappings, and report upon general conditions there for rubber growing. Mr. Easley has completed his examination, and returned to the United States last month (April). He expressed himself as most favourably impressed with the rubber trees that he saw there, the rapidity of their growth with the care they had received, and the quantity and quality of the latex which they yield.

Exact measurements and yields of these trees are not now to hand, but Mr. Easley's experimental tappings indicated that these trees should yield 6 lb. of dry rubber per tree per year; though for conservative estimate purposes he should quote to his people that a yield of 3 lb. of rubber could be depended on.

Less than three years ago small seedlings were secured from Mr. Peabody's estate and planted on the Bula-takai River in Davao in a field of newly-planted hemp. Several harvests of hemp have been secured from this field, and the outlook is good for several more harvests being obtained before the hemp is choked out by the rubber. The largest of the rubber trees are now 32 in. in circumference 3 ft. from the ground, and five spiral cuts with a farrier's knife halfway around each tree gave a yield of more than six-tenths of an ounce of dry rubber per tree from one tapping.

The behaviour of the latex is not that generally attributed to *Castilloa elastica*, in that it is so thick in rubber globules, that though it fills the cut groove to bulging, it has very little tendency to flow over

and down the tree. The watery portion of the latex at once separates and trickles down the tree, but it carries no rubber-bearing fluid with it. One or two days after cutting the bark the dry rubber can be stripped from the groove in long, elastic strings which have a high tensile strength. *Castilloa* rubber was in 1875 imported into Ceylon from Central America by Mr. Robert Cross, of England, and planted as a shade tree for the tea. The attempts to transfer the seeds failed owing to the vitality of the seeds being very transient, only a few weeks under favourable conditions. Finally some slips reached the Kew Gardens alive, and from these other cuttings were obtained; but the growth of the tree in Ceylon was rather slow, and it gave seed only on attaining an age of 9 years, and then so few in number that large plantings of the rubber was difficult to accomplish.

Tapping experiments in Ceylon showed the yield of *Castilloa* to be rather inferior to Pará, and its growth also slower. Thus reports *re Castilloa* in the Orient have been rather adverse. Careful botanical investigations show, however, that the *Castilloa* of Ceylon is the *Castilloa markhamiana*, and not the true *Castilloa elastica*.

The *Castilloa elastica* and *Castilloa markhamiana* in their native habitat are giants of the equatorial American forests. They there thrive best in dense, steaming warm forests, where it rains nine months in the year. Temperatures of 75° to 80° there prevail, and rainfalls of 60 to 100 or more inches annually.

Rich, sandy, alluvial loams along rivers seem to be ideal, but the soil must be well drained. Heavy soils in which Pará may thrive are not suited to *Castilloa*. In Panama the trees often attain heights of 160 to 180 ft., diameter 5 ft., and yields of 100 lb. of india-rubber per tree per year* are there known.

The first slips brought to the Orient by Mr. Cross were obtained from the Chagres River, Panama, the present site of the canal construction. Mr. Cross reported that these giants of the forest were being ruthlessly destroyed, as the native collectors generally felled the trees to secure all the rubber that they contained.

The *Castilloa* is the largest known rubber-producing tree. In Mexico it attains a height of 45 to 50 ft., with diameters of 18 to 36 in. While it will grow up to 2,000 ft. elevations and on poor soils, it does best at low elevations and on well-drained, well-watered, rich alluvial soils. Plantings in Mexico have generally been made 8 x 8 or 12 x 12 ft. apart. The tree grows so luxuriantly in the Philippines that it is believed that 15 x 15 ft., or 193 per acre, should be the minimum spacing.

Plantations in Nicaragua and Mexico, where inter-crops such as bananas, corn, beans, &c., are grown, the cost of bringing large plantings of rubber to a tappable stage at five years is 25 cents Mexican currency per tree, and the first year of tapping is expected to yield 2 $\frac{4}{10}$ lb. of dry rubber per tree. Trees under favourable conditions of soil and light shade in Davao, without special care, attain to a tappable stage in three years. It would seem that such a tree deserves the best of care, and that the caretaker would be thus liberally rewarded.

* We have always heard that young *Castilloa* rubber is generally resinous, and also weak and tacky.

* Believers in extreme yields should note this.

The Central American and Mexican trees are said to have no enemies, either insect or animal. A few trees have been destroyed in Davao by white ants. The wild hog does not injure it. An occasional young seedling has been known to be browsed by the deer. The best growth of the *Castilloa* trees on the Bulatakai was observed among those planted in the hemp. It appears that some shade is grateful to the tree. Trees planted in exposed places on heavy or poorly drained soils have made indifferent growth. Thus it appears that careful selection of location is as essential for rubber as for coco-nuts and hemp. From observation in Davao, it appears that irrigation stimulates the growth remarkably if the soil be porous.*

Southern India News.

THE DEMAND FOR SPRAYING MACHINES.

We received with much pleasure a long letter from Mr. Rudolph Anstead, Government Planting Expert, Bangalore, S. India, in which he reports steady progress in all ways throughout that part of India of which he has charge. This is undoubtedly due to the steady but quiet work being done, and the published results which the planters around have been making use of, knowing when they see any statement in print, emanating, that is, from their own department, that it can be relied on as having been tested before publication.

Ceará rubber is turning out a great success at Coorg, and probably those interested in this class of rubber will soon be seeing the publication of figures showing the cost of production and profit obtained. Three of the States have fitted up factories with the latest machinery and are turning out good stuff.

Elsewhere some valuable manurial experiments have been undertaken with coffee in conjunction with the Potash Syndicate, who have given a small subsidy; and tests are also being made to gauge the value of nitrolim. We feel that these experiments will prove valuable for coffee. Tea manuring is also being carried on on an organized basis to test results. The system, so far as we can gather, will extend over a period of three years, during which the manure applied each year and its relation to what is already in the ground will be carefully noted. Some of these results have already been published, as in the *Planters' Chronicle*, vol. viii, p. 208, which experiments were carried out on purely practical lines.

The next item in the programme is to carry on experiments with explosives,† chiefly to remove the

big stumps, which are at present left to rot and tend to generate disease. Such work would be very much more in use were it not for the very stringent regulations about moving and possessing large quantities of high explosives, which are for obvious reasons unfortunately necessary in India. Meanwhile our friend the Trehwella Monkey Jack is proving a great success and a great many of them are in use.

From other sources we understand that of one make alone, we believe a pneumatic knapsack machine, over a hundred are being shipped or have been ordered for this district, and other orders will follow. According to Mr. Anstead, the ordinary sprayer is too big and heavy for the coolie, who cannot carry it and pump and spray at the same time; for this reason pressure or pneumatic sprayers must be used. Another correspondent out in Southern India writes: "I am very much interested in the article in your May issue on 'Spraying Operations in London.' We have got *Lecanium viride* scale spreading on the coffee and we may yet have to instal a system similar to what you refer to; for this reason I should be glad to know the cost of an outfit as used in Richmond Park, together with some idea of the expense, as we are very interested in wholesale spraying operations just now, and members of the planters' associations are being asked to lay in a stock of insecticides so as to be prepared should the pest (green bug) appear. It is to be hoped, therefore, that the sprayers ordered will soon appear, as working without them is like playing Hamlet with that worthy missing."

DIE DYSENTERIE. By Professor Dr. Ludwig Kütz, Imperial Government Doctor. 64 pp. Several illustrations. Price 2 marks. Fr. W. Thaden. No. 11, Mönckebergstrasse, Hamburg.

This small book consists of five popular reports on the existence, prevention, and self-treatment of dysentery among Europeans and Natives in the Tropics. As such it should prove very useful to those residing abroad, as it discusses fully the cause and progress of the disease, and the prevention of same to a great extent by careful attention to the water supply, or if contracted its cure and treatment, and the last chapter specially deals with dysentery among the natives. The author has already dealt with malaria and blackwater fever in a former treatise. Those who can read German will certainly find these treatises worthy of attention.

* Many planters of *Castilloa* obtaining but poor yields should be glad to hear of this.

† From the Ceylon papers we learn that the use of dynamite in planting, so far as the Department of Agriculture is concerned, has passed the experimental stage. On the new plantations at the Peradeniya and Heneratgoda Botanic Gardens, dynamite is now wholly used for holing in tree planting and in removing tree stumps and boulders. In holing, after the charge has been fired, the vent in which the cartridge was inserted is closed with earth and left so for a day in order that the gases may permeate the soil and destroy the toxins, which are destructive to the bacteria of nitrification. It is believed that the gases would also kill insect pests which harbour in the soil, but on this point no definite statement can be made. The use of dynamite in agriculture is extending in the Island, we hear, and many planters have adopted this time and labour-saving process.

It is with great regret that we have to report the death of Sir James Lamont, Bart., of Knockdow, Argyllshire, and father of Mr. (now Sir) Norman Lamont, who, as reported in our July issue, opened the discussion, at Sir Robert Perks's "At Home," on "The Need of Establishing Agricultural Colleges in the Tropics," which institutions he has been warmly advocating since 1902. Members of this branch of the Lamont family have owned or been interested in estates in Trinidad (W.I.) for probably a hundred years.

Robusta Coffee and Rubber.

As to precisely what amount of independent planting of Robusta coffee there may have been among Dutch planters in Java is difficult to find out, the *Brazilian Review* of June 3rd tells us, but from careful perusal of the reports of most of the British rubber-cum-coffee planting concerns in Malaya, Sumatra, and Java, it would appear that as a rule interplanting of coffee with rubber has not proved an unmixed success, and, in fact, a great deal of the coffee trees have been already rooted up. In few of the reports, indeed, is there any allusion to coffee planting or the yield of coffee trees at all, from which it would be gathered that coffee cannot so far have assumed much importance. The report of the "Java Pará Company" is, however, more detailed. On this estate, runs the report, 696 tons of coffee were sold last year at prices equivalent to the sterling yield of 300,000 lb. of rubber. This coffee was derived from 750 acres (524 hectares) planted with Robusta. There are on the same estate 1,311 acres more (916 hectares) planted with Robusta not yet come to maturity. The bearing trees yielded 11 piculs (677 kilos) per acre; 225 acres more being expected to come into production this year. The average price realized was £3 10s. per picul (£3 8s. 3d. per bag), whilst the current crop was all sold ahead at £3 15s. per picul, *i.e.*, 5s. more than last year and 12s. more than current prices. When all the Robusta coffee is in full bearing production should amount to 20,000 piculs (20,507 bags). A contract was entered into for planting another 700 acres with Robusta without any cost to this company beyond making over to the contractors the coffee gathered during the period requisite to bring the new rubber to maturity.

The *Bulletin of the Imperial Institute* some little time back, when discussing the characters of Robusta coffee, said that in certain vegetative characters *C. robusta* would seem to occupy the same relative position with regard to *C. liberica*, as does that species to *C. arabica*. Robusta coffee grows more rapidly than Liberian, a plant eight months old being much taller and possessing more branches and leaves than Liberian coffee twelve months old. The plant is of a more robust habit, and the leaves, though variable in size, are larger than those of *C. liberica*, thinner, and of a lighter green colour. The branches, however, have a tendency to bend downwards, so that the bush becomes somewhat umbrella shaped. Like *C. liberica*, the plant flowers throughout the year, the flowers being intermediate in size between those of the species named and of *C. arabica*. Perhaps the most striking feature of Robusta coffee is the large number of berries borne in the numerous thick clusters, each of which contains on an average forty to sixty berries, though larger numbers are frequently met with. The berries are much smaller than in Liberian coffee, but, since the pulp is thinner, the beans are not markedly different in point of size from those of *C. arabica*. Gallagher states that on an average 10 cwt. of Liberian berries give 1 cwt. of marketable coffee, while only 4 cwt. of Robusta berries are required to yield the same amount. In the case of the latter coffee, many more berries go to the hundredweight than is the case with Liberian coffee, but the greater number on the branches renders the picking if anything cheaper.

The red pulp is easily removed, as is also the thin parchment.

Quality of the Coffee.—Considerable variation is to be found in the opinions expressed as to the quality of Robusta coffee, but it is not improbable that such differences are in some measure to be explained as a result of different methods of preparation, not all of equal excellence. It is stated that the beans do not possess a first-class colour, and that for the first two crops a good aroma is lacking. Dr. Wildeman affirms that the flavour recalls that of Liberian coffee, but with less aroma. Hart compared Robusta coffee with the coffee of Costa Rica and the East Indies; while, according to Cramer, the quality of well-prepared Robusta coffee is approximately that of middling Arabian coffee. The beans possess a bluish green colour, similar to that of the Arabian product, but they are of a somewhat different shape, being larger and more convex on the curved side.

In preparing Robusta coffee for consumption, concludes the *Bulletin*, it is necessary that the beans should be well roasted, and it is stated that the coffee loses less weight during this process than is the case with other kinds.

The History of the Sugar Industry in Formosa.

By Mr. SADAŌ YAMADA, of Tokyo.*

THIS industry was started in the southern part of Formosa by the Chinese as far back as the sixteenth century. In 1624 the sugar-producing industry had been run by the Dutch (who then occupied Anping and Tainan, two Formosan cities) for thirty-seven years, and was at that time considered to offer a promising career for those following it.

In 1661 one Tei Seiko, a subject of the "Min" dynasty (the one before the last, and who therefore apparently did not recognize the then ruling powers, nor the previous one as the legal ruling family), escaped to Formosa, whence he had fled rather than surrender to his enemy the members of the "Shin" dynasty, which had been the rulers of the land for some 300 years until within a few years of Seiko's escape. Arrived in the island, Tei Seiko imported some stumps or cuttings of sugar canes from Fo-Kien, a state of China, into Formosa, where for some twenty years he continued to carry on the industry, improving as he did so both the variety of cane planted as well as the methods employed for the preparation of the sugar until 1683, when "Kismet" overtook him in true Eastern fashion, for his enemies of the "Shin" dynasty found him and he was "destroyed," whilst the island was attached to China. By this time the sugar industry, which had been so carefully developed by the efforts of Tei Seiko, had so far increased as to be able to export sugar, not only to Japan and China, but even to far-off England and elsewhere. After 1895, when Formosa was ceded to Japan as a result of the Chino-Japanese war, internal troubles and disputes raged between the Formosans and the Japanese, and at the end of that time the sugar-planting industry had been

* *Our Friend* for June, 1913.

practically, if not completely, destroyed. Since 1902, however, the Japanese Government took the sugar industry in hand to revive it, and since then the Governor-General of Formosa has encouraged the industry, both productive and manufacturing, in all ways, especially to get the planters to make their sugar on the European system; thus the head of all the officials in Formosa even went so far as to visit many of the companies' estates and factories, whose output amounted to some 300,000,000 kin* (400,000,000 lb., as kin = $1\frac{1}{3}$ lb.).

Coming to the present time, the prospective production of sugar in Formosa for 1913 has to be based on the area and output of the following seventeen companies:—

Taiwan Sugar Co.	...	...	18,800 ko†
Toyo " "	...	...	5,500 ko
Rinhongen Sugar Co.	...	...	2,000 ko
Chūo " "	...	...	3,700 ko
Taihoku " "	...	...	1,800 ko
Tainan " "	...	...	1,200 ko
Minami-Nipon Sugar Co.	...	...	1,200 ko
Meiji " " "	...	...	6,000 ko
Ensuike " "	...	...	8,600 ko
Dai-Nipon " "	...	...	7,000 ko
Nūtaka " "	...	...	5,500 ko
Hokko " "	...	...	3,200 ko
Toroku " "	...	...	2,400 ko
Shinko " "	...	...	1,500 ko
Teikoku " "	...	...	2,400 ko
Others ... ...	...	...	1,200 ko
Total			72,000 ko

These companies will tell you that their total area under cane amounts to 87,200 ko, but the acreage actually planted is only 72,000, as above, against 72,670 ko last year, which produced 104,600,000 kin (139,467,000 lb.), the output being reduced owing to damage to the canes by wind and water, for the normal average crop should be at 42,000 kin (56,000 lb.) sugar per ko, some 300,000,000 kin (or 400,000,000 lb. English). This is the estimated output for the present crop, and is arrived at as follows: 42,000 kin of sugar per ko, on a basis of 10 per cent. sucrose in the cane, which should amount to 302,400,000 kin.

The companies mentioned planted the 72,000 ko with cane, as shown in the table, early this summer, taking every precaution to safeguard them against damage by wind and water, as they sustained last year and the year before. At the beginning, this year's growth was more or less injured by the extreme cold weather, though their general progress was afterwards better on account of more favourable weather. Generally speaking, however, the climate and weather are both favourable, and this being so at present, we hope, unless tempestuous weather comes along, to have an average sugar crop in Formosa this year of about 300,000,000 kin, or 400,000,000 lb.

ACCORDING to the *Gold Coast Leader*, the authorities at Lartey are contemplating running a light railway to the foot of the nearest hill to facilitate the transport of food-stuffs which are scarce in the town.

* "Kin" is a weight measure in Japan, China, Corea, and Formosa and is about $1\frac{1}{3}$ lb.

† "Ko," a square measure used only in Formosa, is about equal to a "hectare" or $2\frac{1}{2}$ acres in England.

Coco-nuts and Pestalozzia Palmarum.

A READER in Jamaica wrote asking us if any remedy has proved successful in combating the disease *Pestalozzia palmarum*, with which coco-nut palms in certain centres are much troubled, as stated in our book on "Coco-nuts," pp. 277-278. To this we replied that well-fed trees on carefully cultivated lands should be able, as a rule, to throw the disease off should it attack them, but if badly attacked it is best to dig the trees up, and burn them, as the trouble is one that tends to spread. As a remedy, when the trees are to be treated and not destroyed, Mr. Petch suggests the application of potash manure, and we would suggest in the face of this that kainit be chosen, since it has always been claimed that this is specially suited for coco-nuts and is comparatively cheap. Furthermore, as advised in our book (p. 238), coarse salt placed in the crown of trees showing signs of having the disease, might, by gradually melting and dispersing itself in and out of the crown, counteract and finally check the disease; as kainit is largely made up of common salt, it should have all its advantages as well as others of its own.

As regards this disease, reports one authority whom we consulted on the matter, evidence goes to show that the pest is most prevalent where potash is scarcest, and under such circumstances you need not hesitate to recommend the substitution of kainit for common salt, since kainit consists of common salt to the extent of more than one-third of its weight, and of other readily soluble salts, with well-known fungicidal and insecticidal properties in considerable quantities. When kainit dissolves, therefore, and finds its way as a liquid into all the nooks and corners of the crown of the palm, it is certain to have a much more pronounced effect than ordinary salt, and not only will combat the disease directly, but will also, on account of its properties, go far to restore the plant to health by supplying its roots with potash, as the fluid runs down the bark, and in doing so still carries on its curative work, until it finally reaches the ground. It was, as already stated, probably a shortness of potash that caused the tree to contract the disease.

ACCORDING to Mr. Consul-General Chalmers's report on Corea for 1912, the export of soya beans last year almost recovered the position that it held in 1910, showing an increase of 11,868 tons, valued at £65,220, over 1911. The trade might have been larger, but there is a growing demand in Corea for the beans as a food-stuff in consequence of the high quotations for rice and the increase of Japanese settlers in the Peninsula.

WE understand that ex-President Theodore Roosevelt intends visiting South America next October, and will give a series of lectures in Argentina on international and social subjects. He will also visit Brazil and Chile, and perhaps make a number of excursions into the interior of the continent.

TEA NOTES.

SOME attention has been directed to a statement by the Chancellor of the Exchequer in the House of Commons with reference to food taxes, that he (the Chancellor) had heard from those fighting the scourge of consumption in his part of the country that excessive tea drinking had a very bad effect on the spread of the disease. It will be admitted that excessive tea drinking can be injurious, as is excess in any other liquid or food used, but if Mr. Lloyd George has no better argument to support the present high duty on tea which principally affects the poorer classes, whom he so often champions, his clinging to it for revenue purposes against his inclination is within measurable distance of being abandoned.

But even excessive tea drinking will not produce tuberculosis, though it may, when improperly brewed, produce gastric disturbance or a variety of nervous symptoms, and so conduce to general debility, making the person more liable to infection. The same results, however, would attend excess in any other commodity, as those who over-indulge in iced-water in the Tropics often find to their cost, so the argument has little force, and was loosely used merely to defend the taxing of food when challenged by a Labour member in the House.

The tannin in tea is generally considered as the source of mischief in excessive tea drinking, but it is not generally known that there is more tannin in claret than in tea, and that whereas in wines it is in the free active state, in tea it is neutral or fixed and incapable of acting as a tanning agent. Hence tea-drinkers can view with complacency loose theories propounded merely for party purposes, and without much thought of their being taken seriously. "Excessive" tea drinking is an ambiguous term, but we know of one man who does even a fuller year's work between January and December than falls to the lot of Mr. Lloyd George as Chancellor of the Exchequer, and yet seldom drinks anything between his breakfast and tea, when the quantity of tea he consumes has at times amused many people both here and in the Tropics. On one occasion, after riding from seven o'clock in the morning until past four in the afternoon inspecting cacao estates in Trinidad, with "Johnnie Gibbons," who was then at Val d'Oro Estate, Maraval, tea was made, and Johnnie and our friend consumed pots full, until the host ran out of tea, and knowing our friend was a teetotaler, said that if he had known how much tea they needed, he would have offered them nothing but whiskey. All the same, he is in excellent health, and only recently had to undergo an additional examination when increasing his life policy, because he showed for his age (45) so few signs of wear and tear. Properly made, therefore, tea need not prove harmful, and in this case it has, we are sure, only been beneficial.

Following on the above remarks, we would suggest that those anxious to see the consumption of tea encouraged and increased should call attention to an attractive, popular work on the subject which was recently published; we refer to "Tea," by Miss Edith A. Browne, author of "Sugar" and "Rubber" of the "Peeps at Industries" series published by Messrs.

A. and C. Black, 4-6, Soho Square, London, W., and obtainable from the Macmillan Co. in New York, Toronto, Bombay, Calcutta, and elsewhere. The careful and interesting details of the various processes entailed in the preparation of tea for market are interspersed with attractive and beautifully reproduced photographs of tea scenes throughout Assam, Nepal, Ceylon, Formosa, China, Java, &c., both on the estates, in the factories, or *en route* for the station or shipping jetty. With a picturesque but strong cloth cover the book only costs 1s. 6d. net. and at that price the large producers and distributors of tea should secure copies and place them out judiciously where the trade needs to "buck up." To show that the technical terms in the work are correct and up to date, we notice that Miss Browne, the same as several of the authors in our book on "The Fermentation of Cacao, Tea, &c.," tells us (p. 37) that oxidation of the leaves is the correct term rather than the more common one of fermentation. We also noticed that the illustrations included one showing a coolie in India spraying the plants.

Those interested in tea, who read the article published by *Capital*, of Calcutta, in their issue of June 26th, concerning the London buyers' request that the parcels of Indian tea should be larger, and not broken up into a number of small ones, because of the different grades of leaves that go to make up the shipment, will find this same matter is discussed at length by Dr. Oscar Loew and Dr. Schulte im Hofe, in our book on "The Fermentation of Cacao" and other tropical produce. We hope when the book reaches India that the planters will note what the above authorities have to say on the subject, especially when, as is pointed out on pp. 46, 47, quoting leading authorities in India, it is doubtful whether there is any agricultural pursuit about which less is known by the men occupied in it than tea.

The West Coast of Africa is going in for more tea. According to the 1912 Report of the Southern Nigeria Agricultural Department, issued by Mr. Frank Evans, Acting-Director of Agriculture, it is proposed to extend the area under tea (*Camellia thea*) at the Experimental Station, Onitsha, S. Nigeria, and three samples of the leaves forwarded to the Imperial Institute have been favourably reported on.

There was a varied selection of Indian teas from all districts, especially from Assam, offered for sale during the second week in August. The tendency of prices in the room was in many respects similar to that obtaining at the sale previous to the holidays, except that the gradual improvement in tone noted then has developed since into a distinct advance for good and fine liquoring grades. Good medium teas between 9d. and 10½d. were also wanted. Among the low medium grades, a little irregularity was sometimes apparent, although in very few cases were lower quotations recorded. The average for the whole Sale on Garden Account was 9¾d. per lb., against 9d. per lb. a year ago. The Assam Company's first sale realized an average of 9½d. per lb. The average for Ceylon tea on Garden Account was 8½d. per lb., against 8d. last year. Competition for Ceylons on the whole was good, though quality showed a falling off in a good many

cases and the improvement lately noticed was not maintained. The strength of the market was proved by the fact that teas which were inferior to last frequently sold at last prices. Tea for price was in strong demand and sold at very full rates, though a few low quotations were made for teas which were full of red stalk.

Review.

MOZAMBIQUE: ITS AGRICULTURAL DEVELOPMENT. By R. N. Lyne, F.L.S., F.R.G.S., Director of Agriculture, Ceylon, and formerly Director of Agriculture, Mozambique and Zanzibar. With 16 illustrations and map; 352 pp., including 90 pp. on the Land Law for the Province of Mozambique. Price 12s. 6d. net. T. Fisher Unwin, Adelphi Terrace, London, W.C.; and Inselstrasse 20, Leipsic, Germany.

East Africa up to now has not made much of a name for itself as a producing centre, although Germany has certainly been doing its best to remedy the defect. Zanzibar and its export of cloves alone stands out prominently, and maybe, if Nature had not given this valuable crop almost for the asking, agriculture would not have been so behind the times out there; the fault certainly does not lie with Dame Nature. "No part of East Africa with which I am acquainted can compare in fertility with the district of Quilimane," writes Mr. Lyne; "it has a good rainfall, an adequate water system for irrigation and transport, and a fertile soil, and there is a clear 400 kilometres of land fringing the coast suitable for coconuts; how far inland these palms can be cultivated with profit is uncertain." Mr. Lyne's description of this area and its soil deserves attention, and so do the details given of the hinterland for tobacco and vegetable, &c., production, whilst we are told (p. 36) that there are 1,000,000 Ceará trees coming on to the tappable age. With irrigation, sugar, and also sisal and Ceará rubber should do well; on the other hand, with adequate drainage the magnificent fertile plain of the Incomati (p. 51) should produce immense crops, and when one thinks of what has been done and it is proposed to do with the 10,000,000 acre swamp, known as the Everglades of Florida, it ought to be a comparatively easy task to run off the water from the Incomati flatland, which at present is covered with water, 2½ ft. deep, for two months out of the twelve. Chapter 7 of Mr. Lyne's book deals with sugar, and Chapter 8 with coconuts, of which three companies alone have over 1¼ million palms coming on, but they are close-planted, say, 7 × 7 and 8 × 8 metres, so will not do so well as if 10 × 10 metres. Fibres, tobacco, ground-nuts, black-wattle and mangrove bark, cattle-breeding, fruit-growing, and a dozen other crops are all discussed in turn; even *Euphorbia tirucalli* is not forgotten, and we are told (on p. 182) that if "tirucalli will pay anywhere to cultivate, it is in Lourenço Marques, where thousands of acres of the sandy soil that it loves await their crops." All those interested, not only in the Mozambique country, but in Equatorial Africa generally, will wish to place Mr. Lyne's book on their shelves once they get a glimpse of it.

A Commercial Rapprochement Between China and Japan.

IN face of the state of affairs, as outlined in our leading article for June, regarding Japanese and Chinese emigration prospects to Latin America, it is interesting to note that, according to the *Journal of the Yokohama Chamber of Commerce*, a Japan-China Corporation has been formed, under the initiative of Dr. Sun Yat-Sen and Baron Shibusawa, to exploit the resources of China. The project is now materializing, the prospectus of the concern being before the public.

The company will be organized in conformity with the commercial law of China, and the line of business to be undertaken will be to invest capital in railways, mines, and other enterprises in China, and to act as agents between Japanese capitalists and Chinese business men. The capital of the company is fixed at five million *yen* (£100,000), of which one-half will be raised in Japan and the other half in China.

The shareholders will include the leading banks of Japan, while on the Chinese side almost all the business men belonging to the Kuomintang are expected to subscribe to the shares.

When the company is duly organized the head office will be established at Shanghai, with a branch at Tokyo. As to the officials of the company, it is said that an equal number will be elected from among the Japanese and Chinese shareholders, Baron Shibusawa and Dr. Sun Yat-Sen possibly being nominated to the presidency.

From the same source we learn that Japan also has its eye on India. Mr. Noma, Expert of the Department of Agriculture and Commerce, having recently returned from a tour through our Eastern Empire, as a result of which he is apparently dissatisfied with the present condition of Indo-Japanese trade, and urges his countrymen to form a guild or company in order to promote wider trade relations between India and Japan.

Meanwhile references to the employment of Chinese and Japanese labour in South America are constantly met with in our exchanges. Mr. C. E. Akers, the Chief Commissioner of the now famous Akers Report on the Rubber Resources of the Amazon Valley, in answer to a query by the *Times of Ceylon* regarding the importation of Chinese labour, said that the matter was under consideration, but at a standstill owing to the state of affairs in China.

The same paper (*Times of Ceylon*) also reports the exercising in Colombo of 107 Japanese, all ex-army and navy men, who were landed at Colombo on the way out to work for the St. John del Rey Mining Co., Ltd., Brazil, and if this trial lot proves satisfactory another 400 will follow, together with the families of the 500 men. Again, the *Brazilian Review*, of Rio, in its issue of July 8th, tells us that an interesting account of the Japanese workmen, employed on the quays at Santos, recently appeared in the *Diario Popular*, of São Paulo, and reports that "taken all round the little brown man, both in peace and war, is hard to beat. . . . As a worker and economist he is a holy terror, and if the white man will not employ him it is because he feels the Jap to be too good for him." These remarks are of interest, but,

as outlined in our June leader, what the European and American trader and planter has to look out for is not the question of employing the Jap or Chinaman as a labourer, but of competing with him as a fellow merchant, financier, and land-owner. Whether they go out as labourers or land-owners, we believe the "whites" will soon find a large proportion attacking and swarming up the walls of established South American trading concerns, to secure their share of the profits, in the same way as the Japs attacked and got inside Port Arthur and other Russian strongholds in the East during the Russo-Japanese War.

English Capital and American Ploughs in Argentina.

WHILST the *India-Rubber World*, of New York, for August discusses new uses for rubber, such as rubber flowers and corsets for ladies when bathing, ear-drum protectors, fly-swatters, damp-courses in buildings, fittings on board ship, &c., its ubiquitous and indefatigable editor, Mr. Hy. C. Pearson, has been investigating new centres of production, for the same journal includes a photograph of him with two rubber friends in Argentina, whither Mr. Pearson has journeyed to discuss the rubber trees of the Chaco round about Salta, some of which are said to give 18 to 20 lb. of rubber per tree. Whilst awaiting his report in a future number, English plough engineers should note what Mr. Pearson says regarding some of his fellow travellers: "There were men from a huge American agricultural implement-making concern, who told of the use of American machines, because they (the farmers) could not get anything else." We wonder if this is only a specimen of commercial travellers' "swank," but, if not, and it is true, we are still more perplexed as to what the English makers are doing, especially as Mr. Pearson's opening words tell us "Americans speak wisely, and albeit sadly, of the immense possibilities of Argentina, and of the fact that Europe is profiting hugely by its exploitation, whilst the Yankee is doing nothing." Is this but another proof of the correctness of our remarks in the July issue, when we said (p. 133), "unless we have more Englishmen in South America . . . we shall be investing our capital to benefit other countries."

THE *Ceylon Observer* of July 22nd had an interesting leading article on "Zanzibar, the new Crown Colony," the Protectorate having, from July 1st, been transferred from the control of the Foreign Office to that of the Colonial Office, and again incorporated with British East Africa, from which it was separated in 1904. Coco-nuts, we are told, grow in Zanzibar with no cultivation whatever, reaching the production stage at 8 years old, and continue to bear until 60 or 70 years old. Cacao has been successfully grown at the Government Experimental Station, but, with the exception of the clove industry, agriculture in Zanzibar, according to Mr. R. N. Lyne, is in its infancy.

West African Cacao.

IN face of the dominating importance of West Africa as a cacao-producing centre, it is interesting to note that continued efforts are being made to improve the quality of the beans, and with this end in view drying houses and fermenting boxes have been established at the Agege model farm and at Moor Plantation, whilst a dryer, made by Messrs. David Bridge and Co., Ltd., has been erected at Agege, and farmers are encouraged to bring in their beans for treatment free of charge. The results so far have been very satisfactory.

According to Mr. Frank Evans, Acting-Director of Agriculture, who has had considerable experience in Trinidad, B.W.I.,* a full description will shortly be published of the canker disease which attacks the stems of the West African trees, and which Mr. Evans considers to be the most serious cacao disease in the colony.

The cause of this canker, he tells us in paragraph 39 of the 1912 Report, may still be regarded as a matter of dispute. It has been ascribed to two different fungi at least, *Phytophthora faberi*. Maubl. and *Spicaria colorans*, an imperfect stage of a *Nectria*. The former, he tells us, "is one of the most serious pod diseases, I have not yet found here. I have frequently found species of *Nectria* and *Calonectria* on diseased stems associated with various imperfect stages, but, in the absence of a knowledge of their precise relations, which could only be determined by cultural method, I am not prepared to make a definite statement on the question. But quite apart from the question of *Phytophthora* var. *Spicaria*, another fungus which produces effects very similar to 'canker' is at work in this Colony. Unfortunately, owing to lack of equipment, it has not been possible to work upon the life-history of this imperfect fungus, which has been found on all parts of the plants except the roots and fruits."

The experimental station has 17.6 acres planted with cacao, 12 by 12 ft. and 15 by 15 ft. apart, with *Pithecolobium saman* (the rain-tree of Jamaica), planted as permanent shade at 48 by 48 ft. and 45 by 45 ft. apart. Pigeon peas (*Cajanus indicus*) and bananas are being used as the temporary shade.

At Oron, on Chief Richard Henshaw's estate, are probably some of the oldest cacao trees in British West Africa, reported Mr. W. H. Johnson, F.L.S., the Director of Agriculture; these were raised from seeds brought from Fernando Po by the father of Chief Richard Henshaw more than thirty years ago. The trees, however, are planted far too closely together, and at the time of Mr. Johnson's visit were suffering severely from the dry season, as they are not sufficiently shaded.†

PRESSURE on our space forces us to hold over Mr. Frank Finn's notes on the "Breeding of Birds of Paradise in the West Indies, and the Organization of Egret Production." They will appear in the September issue.

* See TROPICAL LIFE for July, 1912, p. 130, with Mr. Evans as "Our Friend."

† See June TROPICAL LIFE, pp. 113 and 114, about the advantages of wider planting and deep rooting to counteract drought, also the issue for April, 1912, p. 62, where cover crops and mulching are discussed.

Rubber in British Honduras.

CAN PLANTERS EXPECT CASTILLOA TREES LIKE THE ONE SHOWN HERE?



THE above shows a wild *Castilloa elastica* tree in British Honduras. It is one of many growing in the Cayo district on the banks of the Belize River, now navigable by motor-boats some 160 miles up from the mouth. The tree was photographed on February 12th last, when it is reported to have measured 10 ft. 10 in. in circumference at 3 ft. from the ground and 9 ft. 4 in. at 6 ft. up. It is mainly supported by surface roots, and just where the figure (Mr. Robert Franklin, the District Commissioner) is standing one of these roots measured 18 ft. The soil is sandy and well above the river bed. Mr. E. J. F. Campbell, in charge of the Botanic Station at Belize, British Honduras, who sends us the photograph, visited the spot last year to see this and other trees to be found there, which he claims give some idea of how rubber, *Castilloa* at least, flourishes out there. Whether the *Hevea* can do as well proportionately remains to be seen, for on this point Mr. Campbell is silent. But even with *Castilloa*, such trees ought surely to attract the attention of investors and individual planters, for although even where wide-planted (and we are glad to see that wide-planting, even to 30 x 30 ft., is now generally discussed, if not actually adopted, when laying out new estates) such trees as shown in the photograph cannot be expected as a rule, we should still imagine that if *Castilloa* rubber would pay to cultivate anywhere it should pay here. We say this with all the more confidence because it is claimed that coco-nuts also do well in British Honduras, and so those who wish to plant up more than one crop can do so in many places, and so increase the profits and distribute their risks.

THE opening of the Australian Institute of Tropical Medicine took place at Townsville, Co. Elphinstone, Northern Queensland (19° 10' S. by 146° 58' E.), on Saturday, June 28th, in the presence of H. E. The Governor, Professor Anderson Stuart, and many other leading men. The *Brisbane Courier* of June 30th (page 7) has a full report of the speeches, which are worthy of the attention of anyone connected with tropical medicine. The Federal Government voted £4,000 to the work for a year. We congratulate Australia on having such a Government, for when one considers the area and relative commercial importance of the Australian Tropics, which have succeeded in obtaining such a grant, it seems but natural that the people and Government of this country, which cannot nowadays exist for six months without the Tropics, would, without being asked, at least subscribe one hundred times that amount, whereas up to now they have given nothing at all, either to an Institute of Tropical Medicine or of Tropical Agriculture. No wonder some folks who know the Tropics, and what other countries are doing in regard to medicine, agriculture and prison reform overseas, say that the English are getting out of date.

“ALMOST all the soil in South Africa is deficient in phosphates,” says the *Natal Farmer*, “and in practically all cases it pays to apply phosphatic fertilizers. The most commonly used of these are super-phosphate, basic slag, and bone dust. The first-named is the most readily available for plant food; basic slag is slower in action. Potash, though not so necessary as phosphates, is generally of use, especially on land which has been under cultivation for a number of years. The experiments conducted uniformly showed that manuring the soil without phosphates is of no practical value. The primary need of the soil is phosphoric acid, and the next is potash.

THE June number (No. 79) of the *Formosan Agricultural Review*, published by the Taiwan Noyukwai, or Agricultural Society of Formosa, includes, among other articles, notes on “The Causes of the Development of the Sugar Industry in Java,” and on “The Cultivation of Sugar Cane in the Northern Part of Formosa,” “Cultivation of Bananas,” “The Tea Industry of Formosa,” “Afforestation in Formosa,” “The Cultivation of Citrus Fruits in Formosa,” and “Gardening in the Ogasawara Islands.” The journal throughout is printed in Japanese.

TRINIDAD (W.I.) reports show that there is some inquiry for fertilizers in that island, and about the middle of July, business was reported in Peruvian guano (whether Ohlendorff's is not stated) at \$60 to \$65 (\$=4s. 2d.), and nitrate of soda at \$55 to \$65. Sulphate of ammonia was valued at \$75 to \$80. Messrs. Gordon Grant and Co., Ltd., on July 21st, quoted coco-nuts at record prices, we believe, viz., \$36 = £7 10s. (over 1½d. each) per 1,000 f.o.b., for large selected peeled nuts in bags of 100 each. Ceylon about the same time also registered a record in the price of copra, viz., between Rs. 101 and Rs. 102.50 per candy of 560 lb. or 5 cwt. (four to the ton).



“Tropical Life” Friend.—No. 98.

SIR W. H. LEVER, BART.

ON August 6th, under the title of “The Soap-maker’s Romance,” Mr. Harold Begbie contributed, and Mr. Joseph Simpson, R.B.A., illustrated with a portrait, a very good character sketch in the *London Daily Chronicle* of “Our Friend” this month, whose name is a household word wherever fats, vegetable or animal, are produced, and soap used. Scientists, sanitary and hygienic experts and others all agree that to-day the world throughout is much cleaner and given to wash itself than was the case twenty or thirty years ago. The odd exceptions that can be seen at times only throw the cleaner folks into sharper contrast and help to prove the rule. The dirty boy who wished he was a “nigger” and lived in niggerland, with the idea of evading the daily, much less the tri-daily, ablutions, would be sadly disappointed on his arrival in the land of mummies, and piccaninnies, when he was caught hold of, stripped, and scrubbed down, as we have often seen done, whilst the emergence a little later of the soap-loving mammy herself, with black beaming face and ample, immaculate, snowy-white clothes, shows to the most casual observer that soap and water are probably used more freely, *per capita*, in the Tropics than is often the case over here; one has to go to the North or South Pole to evade washing, certainly not to the Tropics. There is only one cloud in the horizon, viz., owing to the increased demand, the high price of the raw materials used, and the uncertainty of supplies, even at these advanced values, may curtail consumption owing to the consequent rise in price of the manufactured article, especially since so large a

proportion of the oils and fats formerly used in soap factories have been deflected to the margarine and other industries to be prepared for human consumption, so that consequently the fight between the buyers of oils for internal and external application has become very keen of late. Then it was that Sir W. H. Lever stepped into the breach and carried out various arrangements for organizing and assuring the necessary supplies of raw materials that laid a solid foundation for the successful expansion of his firm, and were the object of much attention and admiration on the part of those who were aware of what had been going on. To-day everybody knows what the head of Messrs. Lever Bros, Ltd., has achieved, but how he got through the work necessary to bring all this about was a puzzle to those who did not know the man at the wheel, whose portrait is shown at the head of this sketch, and of what he was capable of doing. His unceasing but always perfectly regulated energy can be seen by a glance at the face, which gives some idea of how he has been able to handle the huge concern over here, with its thirteen or more allied factories and concerns elsewhere. “His very appearance,” said Mr. Harold Begbie in his sketch, “may be likened to a gale of wind. The ruffled hair is pushed back from the forehead, the full, clean-shaven, small-featured face is weather-beaten and mottled and worn, the blue eyes stare with a strain of penetration that is never relaxed; he walks with his head pushed forward, as though shoving against storm; every movement of the body, every gesture of the hands, every swift glance of the eyes suggest the action of a mind that is forcing its way through obstruction and definite oppugnance. A short, high-shouldered, deep-chested man, tremendously in earnest, utterly unemotional, Napoleonic without affectation, extraordinary, impressive, successful, overwhelming, everything that means power, strength, and creativeness, not a man for greenwood or riverside, not even at the end of his day’s work a man for the hearth. Yet a little more than twenty-five years ago he was trying his ‘prentice hand on the manufacture of soap, emerging from the chrysalis of a grocery business into the gorgeous butterfly of palm oil. To-day he is the golden luminary of Port Sunlight, the master-mind of enormous enterprises in all parts of the world, civilized and uncivilized, and yet he works from morning to night.”

Having known “Our Friend” since the early days of the Garden City movement, which caused us to visit Messrs. Cadbury’s town (Bournville) and factory, and Port Sunlight, of Messrs. Lever Bros., we can confirm Mr. Begbie’s remarks when he says that from boyhood Sir William Lever was a great reader, and was conscious of deep pleasure in form and colour. The music-room of his house near Port Sunlight is crowded with sculptures, pictures, china, silver, furniture, tapestries, and glass. He has specimens of every great period in furniture, chairs of the most beautiful kind running entirely round this great apartment. And his London house, which we have visited more than once, is more beautiful still; the Hulme Museum for his people at Port Sunlight is filled with wonderful things: he is always collecting, and always giving away—never satisfied, and never at rest, either when at work or play.

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1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

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5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

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8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

AUGUST, 1913.

The Tropics, the Imperial Cinderella.

LIKE THE ORIGINAL, THEY ARE PERHAPS THE MOST IMPORTANT ITEM IN THE HOUSEHOLD.

ON June 28th last year, Mr. Lewis Harcourt, as Secretary of State for the Colonies, in a speech delivered in the House of Commons, reviewed the progress of the Crown Colonies in the Tropics, and for the first time gave them some share of the credit they deserve for all they have done in advancing the prestige and prosperity of the Empire. Now, on July 31st, they received another portion of praise, praise which we feel fell on more sympathetic and enlightened ears than was the case even twelve months ago, and certainly than would have been the case twelve years ago. If any members of the House, a large proportion of whom know TROPICAL LIFE quite well, and especially those of the so-called Labour Party who have recently visited the Tropics, as India, the West Indies, &c., think we are exaggerating, let them instruct their households, and those of their friends, to abstain from using for a whole week any article which, wholly or in part, owes its origin to the Tropics. Let them do this, and see how much the poorer they are both in health and pocket at the end of the time. Then, probably for the first time in their lives, would they learn how entirely the middle and lower middle classes are dependent on the Tropics for cheap and adequate supplies of food and other necessities.

Returning to Mr. Harcourt and his speech, which we feel sure everyone interested in our tropical colonies has read with close attention, and thanks him for it, he himself called attention to the somewhat chilly reception offered to his previous review, but since "it was addressed to a larger audience than that

in the House, being intended for the Colonies themselves," we feel that his words were fully appreciated elsewhere. On this occasion, after calling attention to the supplies we receive from the self-governing colonies, Mr. Harcourt dwelt at length on British-grown cotton, and where attempts to produce it had proved successful and otherwise, pointing out in the course of his remarks that the cotton-boll weevil, one of the most noxious pests in the cotton-fields, was kept in check by the bobwhite quail in the cotton-belt of the United States. By the courtesy of the American Zoological Society he had been enabled to obtain some of those birds, and he hoped to breed more at his house in Oxfordshire, and, if he was successful, he proposed to supply them to some of our own cotton-growing colonies, where they might be naturalized. Trinidad and other British petroleum centres were then discussed, so were the palm-oil concessions to Messrs. Lever, to which firm our Colonial Secretary paid tribute as to the way that firm handled the natives and the aid their enterprise gave this country in its struggles to successfully compete against foreign competition. This done, figures of the West Indian and Cyprus fruit trade were given, and the evergreen cane-sugar industry reviewed; following which came tobacco, in which substantial increases in production were noted, and then rubber, tea, coffee, and whale-oil, the latter of which was spoken of as a new colonial industry. This, we believe, is not strictly correct, as the West Indies have long had whaling stations and even given them up, as pointed out in detail in our issue of September, 1911, p. 174. The fact that a spouting whale is included in the coat-of-arms of Trinidad, as Mr. Harcourt, or anyone else, by ascertaining when this coat-of-arms was drawn up, can realize, shows what an old-established industry whale-fishing has been in that island and certain others of our West Indian possessions. In conclusion, our Colonial Secretary said that "the figures he had given showed how great and growing was our capacity for production. As to the chemical and commercial work of the Imperial Institute, great changes had taken place in its organization and activities in the last few years. It used to be regarded by the public as nothing but the home of show-cases; it was known to-day, at all events among the mercantile community, as a busy hive of scientific inquiry all over our Dominions. He believed that it had an assured future of even greater utility, and he warmly commended its work to the appreciation of the public at home and abroad."*

We were pleased to see that Mr. Mitchell-Thompson, M.P., a member of the Council of the West India Committee, brought the question of agricultural colleges in the Tropics prominently to the front in the course of the discussion which followed Mr. Harcourt's speech, when he asked "if the time had not arrived when we might do something towards encouraging trade on a scientific basis. Could there not be a College of Tropical Agriculture for the purpose of training men in the best methods of production in tropical countries?" Mr. Harcourt, in reply, assured the hon. member for Down (Mr. Mitchell-Thompson) that the College of Tropical Agriculture, which was a most interesting proposal, had his sympathy, though that

* We are quoting from the very full report given by the *Times* in their issue of August 1, pp. 13 and 14.

must not be assumed to carry with it any financial support, which he might not find himself able to afford. All these scientific inquiries into tropical agriculture had added greatly to the prosperity and future prospects of all the tropical isles.

The Agitation for Agricultural Colleges in the Tropics.

THE agitation for agricultural colleges in the Tropics has been continued in influential quarters. We have just shown how Mr. Mitchell-Thompson brought it forward in the debate on the Colonial Office vote in the House of Commons. The West India Committee is, we believe, organizing its forces to lead an attack that all hope and many believe will prove successful; whilst the Ceylon Association and its well-wishers seem to have gone one better, and are arranging not for an agitation, but for the actual foundation of the College itself. The Western hemisphere cannot, however, expect to be so successful in securing their college by means of public subscriptions, as they have not recently had £100,000,000 invested in their agricultural industries, as has been the case in the East. On account of being less wealthy, therefore, and, as explained in our July issue (p. 133), in face of the approaching opening of the Panama Canal, the extreme importance of this country securing a prominent, if not a dominant, place in the commercial and agricultural industries of Latin America, which it can only do by establishing an agricultural college in Trinidad or other of the West Indian Islands, we consider that, in their case, the Government should finance the institution. This idea is encouraged by the willingness and liberality with which the present Government has financed the Cotton-growing Association, that has got, comparatively speaking, so little to show for the £500,000 of public money it obtained, for it is felt that, important as the Egyptian cotton-producing industry may be to Manchester, the agriculture and commerce of the West Indies and Latin America to the Empire at large is still more important. Therefore, one can rightly argue: if the least important can get so much money, why should not the most important obtain a lesser amount that is needed so badly to ensure continuous supplies of food and raw material for this country? If all the money, or even if half the money, that the British Cotton-growing Association has expended in trying to make cotton grow on a commercial scale where it would not do so, were now voted for the establishment of an agricultural college in Trinidad, West Indies, the benefits that would accrue to the profit and prestige of this country would outweigh any profit, on a commercial and lasting scale, that the British Cotton-growing Association has hitherto achieved or seems ever likely to achieve, unless it has the Imperial Exchequer to back it up. We do not grudge the Association the money that their influence enables them to enjoy, but, as taxpayers and ratepayers in this little island, we cannot help noticing Mr. Harcourt's doubt of helping agricultural colleges for the Tropics, whilst the British Cotton-growing Association, of which Lord Emmott, Under-Secretary for the Colonies, is or was a leading spirit, can get so much.

The Light under the Bushel.

THE MISTAKE OF NOT ADVERTISING THE TROPICS.

LONG ago we urged that the Permanent Exhibition Committees, or the local governments of the various West Indian Islands, or else the Colonial Office over here, should open an information and publicity bureau with a capacious glass (shop) frontage on the pavement of a leading street in London, in order to advertise these fertile possessions of ours, as Malaya, Canada, South Africa, and the Australian colonies have been doing for a long time.* The glass front is of course to be used for showing off the produce of the Colonies, books published on their trade, sport, and people, together with trophies and curios therefrom. Without something of the sort no one will learn of the opportunities for pleasure or profit these tropical colonies have to offer, and an institution like the West India Committee, buried somewhat away upstairs in a quiet business quarter, can never do justice to the West Indies as regards drawing the better class, but still woefully ignorant, Englishman to the Islands, in spite, be it remembered, of being under the direction of a secretary whose genius for acquiring information and organizing publicity campaigns, or exhibitions of tropical products on this side, or putting out literature on the Islands is equalled by no one we know of, and we have met a good many organizers in our wanderings round. Having therefore the man, it does seem to us a pity that the West Indies, in addition to having their committee rooms either in Seething Lane as now, or elsewhere, do not run a bureau of information as we have described, with a window and ground floor in a prominent thoroughfare given up to a museum and library of the products, trophies, and literature of the places concerned.

Evidently some members of the Committee are of the same opinion, for we see in their Circular of July 29th, the following paragraph:—

"Australia's acquisition of the famous Strand site and the prospective erection thereon of the magnificent structure which is to house the High Commissioner and the Agents-General is advertising the Commonwealth throughout the world. In fact a series of most valuable advertisements was inaugurated last week when the King laid the foundation-stone of the new buildings. The question suggests itself: When are the tropical colonies of the Empire to follow suit? That is, when are these scattered entities to have their own Commissioner, or several Commissioners, housed in some central building near the main current of London life? The West India Committee could well exercise such functions if provided with funds." And in another column the following:—

The genial Archdeacon of Demerara (the Ven. E. P. Luigi Josa) now on holiday in this country, writes to the *Daily Mail*:—

"You English people are a funny race! What do you know of your Empire and of your own country?"

* See also our July issue, p. 132, where we say: "This is an advertising and pushful age, so let the Imperial Government at home adopt modern methods, as Canada and Australia and also the Federated Malay States are doing, and call attention to the vast areas awaiting development that they own in the Tropics."

Ninety-nine per cent. of you have not even heard of the Kaieteur Falls in British Guiana—the highest and most wonderful waterfall in the world—leaping with a sheer leap of 800 ft. into the lower Potaro River, amid scenery that beggars description. And so easy of access.”

We hope, therefore, to hear more of this matter, for whilst the committee rooms are an excellent rendezvous for a gathering of those converted to the advantages of the Islands as a trade centre, the authorities want to get in the as yet unconverted as well; and to do this, you must have an assertive and prominent shop-exhibition in a leading street where large numbers of men and women pass, as by such means alone will you attract new blood and money where it is badly needed and can be so well utilized. What we now ask for should have been done ten years ago, but to-day it is trebly necessary, as the competition of the other colonies who are already doing as we suggest is diverting men and money more than ever from the West Indies, who so persist in hiding their light under a bushel that the average Londoner knows them not. We have heard at times many carefully considered and sound arguments advanced in favour of the “Federation of the West Indies,” but up to now have not taken part in the discussions. If, however, federation can bring in its train facilities for establishing an Agricultural College in Trinidad or one of the other Islands, or of organizing a co-operative system of advertising the Islands here, in the self-governing Colonies and elsewhere, as increasingly important agricultural and trade centres on account of the approaching opening of the Panama Canal, then we will vote solid for federation and its resultant organization of the Islands’ resources for the above two reasons alone.

The Heneratgoda Trees and Close Planting.

OUR old friend, Professor Berkhout, of Wageningen, Holland, advocated close planting for Hevea rubber in the *India-Rubber Journal*, London, for March 15th, pp. 14 and 15, and carefully discusses the reasons and works out the records that caused him to do so; but “Mid-East,” in *Grenier’s Rubber News* of July 5th, descends on Professor Berkout “tooth and nail” for so doing. Those who, like ourselves, are interested in the matter, whether in connection with planting rubber or other crops, would do well to study both these articles and keep them handy for reference. As shown in the article, pp. 113, 114, in our June issue, on “Wide Planting and Cultivation,” we believe that in the future Hevea rubber trees are more likely to be planted 30 by 30 ft. than 12 by 12 ft. Professor Berkhout, of course, allows for thinning out, and suggests that this should be done when from four to five years old.

Mr. Petch, the Ceylon Government Mycologist, was recently discussing the importance of thinning out the already planted, and therefore too closely planted, rubber estates to give the healthier trees space in which to grow to something approaching the normal growth of a forest tree of that nature. We imagine, says the *Ceylon Observer*, there must be a good deal of thinning-out in store for many a rubber property in Ceylon, especially where any disease is prevalent,

when the knowledge takes root that closely planted and consequently heavily shaded rubber plantations are far the most liable to disease, more especially in those parts of the tree-trunks nearest the ground. As wet weather particularly appears to be conducive to certain kinds of disease—including “rot,” and the present year is not one of the dry cycle—the matter ought to receive particular attention without delay.

On p. 757 of the same number of *Grenier’s Rubber News* (July 5th), we are told, on the reliable authority of the *Times of Ceylon*, that thirty-three of the old Hevea trees, raised from the original seeds brought by Mr. Wickham from Brazil, in 1876, and planted in Ceylon in 1877, have been blown down. These trees therefore are thirty-seven years old, so those having rubber estates will know what to expect later on should a severe gale spring up such as Ceylon was visited with on this occasion. “Never had such stormy weather been known before,” we are told, as that between 2 and 3 p.m. on Tuesday, June 3rd. Fortunately, the famous giant that gives such record yields (275 lb. dry rubber in three and a half years), is still standing, and does so probably because, as we explained in our June issue, its roots have gone downwards, instead of remaining nearer the surface, fighting the other trees, like the thirty-three fallen ones had to do, we should imagine, for moisture and food; this was due to the giant being on the outside of the clump, as Mr. Wickham explained, and the photographs of the trees in Heneratgoda Gardens show.

Those who want further particulars of these trees and their yields should secure a copy of Bulletin No. 4 (costing 40 cents, or, say, 7d. post free), entitled “Yields of some Heneratgoda Hevea Trees,” by Mr. R. N. Lyne, F.L.S., the Director of Agriculture, Ceylon. In this we are told all about the first plantation of the forty trees planted in 1877, when the plants must have been put in, either to be replanted or else regardless of the possibilities of their after-growth, for they were planted irregularly and in so congested a manner that the inside trees were still small in comparison, only the outside trees having room to expand. The second plantation, raised from seeds from the first lot, was planted 12 by 12 ft., with 211 plants, but here again Mr. Lyne points out the difference in size between the outer trees and those in the interior which is very marked, and so they are at the Riverside plantation of eighty-one trees. We have not room here to quote Mr. Lyne’s table of yields, or his reasons why some trees gave more than others; these important details are, however, fully discussed, as is also (p. 72) the proportion of latex to dry rubber. Now that the trees are blown down our readers will doubtless be glad to study their life-history, on the theory that distinguished trees like people attract more attention when dead than alive.

MR. E. V. WILCOX, Special Agent in Charge of the Hawaii Experiment Station, has published an interesting bulletin, No. 41, on the advantages of using tin cans for seedlings instead of earthen pots. Seedlings as papaya, mango, avocado, &c., he tells us, grow more rapidly and with greater vigour in tin cans; this may be due to a difference in evaporation, and a possible stimulation due to the tin and solder of the cans. Experiments to test this are being carried out.

Mr. James Bryce, O.M., in Pekin.

MR. JAMES BRYCE, O.M., who so fully supported our views on the need of this country paying more attention to Latin America and its trade, and who returned home *via* the East, was present in Pekin at the celebrations that took place in the Chinese capital in honour of the twenty-first anniversary of Pekin University, and followed Professor Monroe, of the Teachers' College, Columbia, as a speaker at the reception held by the President of the University (Rev. H. H. Lowry, D.D.), at his residence. This speech, the *Pekin and Tientsin Times* tells us, delivered by one who is well known throughout the world as an authority on education, was a masterpiece, full of moral purport, and took for its main theme the necessity of carefully avoiding the great danger which attended all educational processes, that of acquiring the mere terms and formulæ of education but letting its spiritual essence escape. That, Mr. Bryce insisted, was China's danger, the danger of every student. It was a comparatively easy thing to acquire a large stock of information, but unless the student was thereby so formed in character and moral earnestness that he acquired the very soul and secret which all educational forms were but the vehicle to convey, the life of the nation could not be permanently raised.

MR. A. W. FREMANTLE, Principal of the Agricultural College at Cawnpore, U.P., India, has been experimenting to test the advantages of nitrolim in the cultivation of potatoes. As a result of this we are now told that a plot of 1/20th of an acre was planted with potatoes after the application of nitrolim at the rate of 80 lb. per acre; this gave a crop of 576 lb. potatoes, or at the rate of 11,520 lb. per acre, as compared with 413 lb. to the plot, or 8,260 lb. to the acre in the unmanured area. The difference therefore in favour of the treated plot was at the rate of 3,260 lb. per acre, which at Rs. 1 6a. per 100 lb. gave a profit of Rs. 44, or nearly 59s. This, against the cost of 80 lb. nitrolim, say Rs. 18, shows a net gain of about Rs. 26 per acre by using this fertilizer.

MEANWHILE we see by the *Louisiana Planter* that when occasionally a little molasses trickles from the plant of the Boston Molasses Company into the sea in Boston Harbour, the fish flock around continually, even coming in from Massachusetts Bay in schools and shoals, eager to feed upon the sweetness that manages to escape from the Boston Molasses Company's wharf, and they seem to thrive upon it. In New England molasses have become a standard food article for horses and cattle and they thrive upon it; their coats get shiny and they are plump and sleek. As for the fish, off-shore fishermen report that since the finny tribe were enabled to secure regular rations of molasses their scales are brighter and more lustrous.

BULLETIN No. 5 on Cacao Manuring, published by the Ceylon Agricultural Department, is worth reading.

The Tobacco Fungus.

By JAMES SCOTT.

With Original Illustrations by the Author.

THE tobacco root-rot (*Thielavia basicola*) was responsible not long ago for destroying, or disabling, from 75 per cent. to 100 per cent. of the plants grown in the American fields. When the spores of this parasite (these emanating from the ground) attack seedlings, the latter "damp off" or weaken at the point where they emerge from the soil, then lean over, fall, and decay. With young plants that manage to get a little footing both the tap or main roots, as well as the lateral roots, turn black and become rotten, while the leaves assume an objectionable appearance. If not properly and immediately attended to these plants become absolutely useless, and are converted into contagious danger centres whence havoc spreads far and wide among healthy plants.

It is generally believed that as there are quite twenty-five species of plants, chiefly wild ones, in which this disease has been found, it came, in the



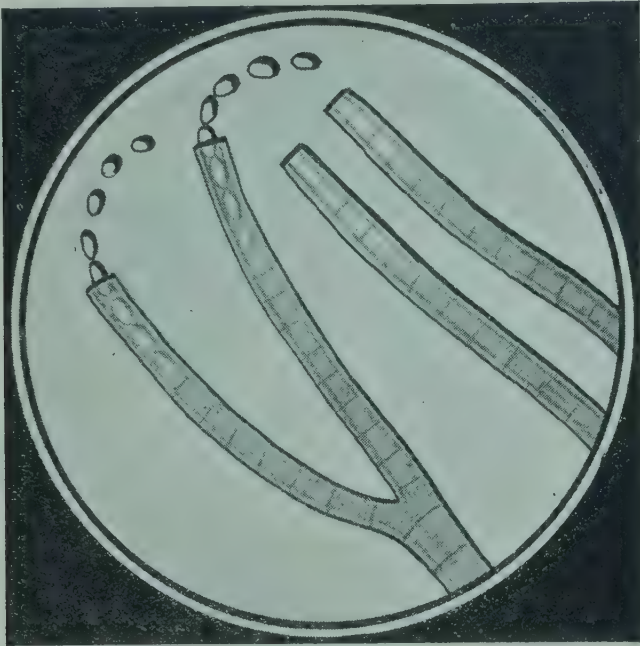
No. 1.—A very minute scrap of the fungus, highly magnified.

first instance, from such uncultivated vegetation. The fungus really seems to prefer the wild plants to cultivated kinds, but should the former get eaten down to a great extent by animals (which would migrate elsewhere), the remaining spores infect the available material of the plantations.

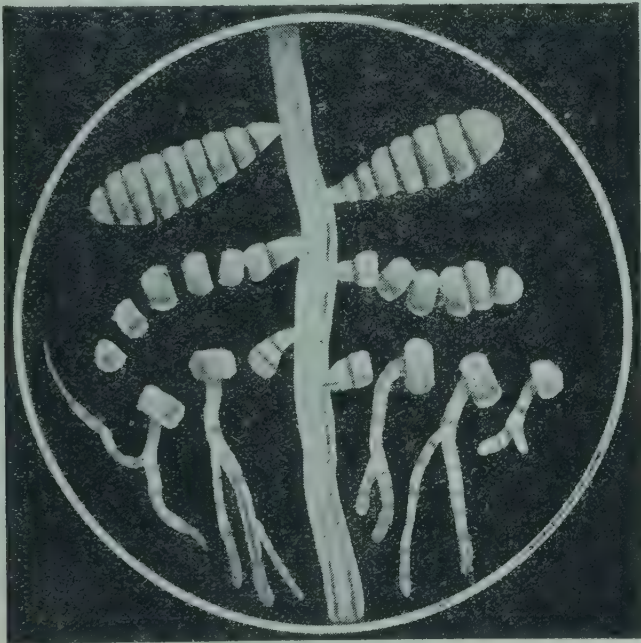
The *mycelium* of this disease is brown, and forms a dense matting or webbing inside and on the tissues of the tobacco plant. At a later stage the *mycelium* changes to a very dark brown.

The *mycelium* gives rise at various points to aerial branches (*hyphæ*), on which three distinct forms of fruit develop, divided into *endoconidiophores*, *chlamydospores*, and *perithecia*. (See illustrations Nos. 1, 2, 3 and 4.)

Groups of fine hollow branches occur at various parts of the *mycelium*, and appear in their side view not unlike the edge or side of the pile of velvet. They are rudely forked, and their terminal portions give rise to conidial spores. These forked branches are



No. 2.—*Endoconidiophores*, very highly magnified. These are fine, hollow filaments, from which *conidiospores* are ejected in necklace arrangement.



No. 3.—*Chlamydospores*, very highly magnified. These break up into germinating segments.



No. 4. A *perithecial* ascus, very highly magnified. This object contains a collection of hollow, transparent cases (*asci*) in which *ascospores* occur.

the *endoconidiophores*. The *conidial spores* are ejected from the *endoconidiophores* like a string of bullets from a rifle. The ends of the hollow branches, which may range in size from 90 to 170 microns (a micron is $\frac{1}{25000}$ inch), are tubular. Inside these tubes the transparent substance shrinks away from the outer shell of the tube, and divides crossways into segments which break off as separate conidial spores that are pushed successively out from the terminal orifice.

A more noticeable style of reproduction is that embodied in the *chlamydospores*, which are comparatively short, irregularly situated, swollen branches that get constricted transversely into boldly defined segments. First light hued, they become later quite dark in tint. There may be four, five, six, seven, eight, or nine segments, every one being perfectly cylindrical. When ripe they break up, and each segment serves as a spore by germinating into a branched thread mass. The bottom divisions of these *chlamydospores* are generally transparent, colourless, and devoid of the germinating power inherent in the remainder.

The third method of fruiting is by means of *perithecia*. A *perithecial* is semi-globular and closely adherent to the surface *mycelium*. The wall of this object is thick and transparent, and its general colour is brown. Beneath the wall, especially when a *perithecial* is pressed between two glass slides, can be seen the oval, beady *ascospores*. No provision is made for the escape of the spores, therefore they depend for freedom on the accidental rupture of the enclosing membrane.

The whole of this parasite, as shown in illustration No. 1, would occupy a space far less in diameter than a mere pin-hole, and the various spores are, of course, quite invisible until magnified. Yet any of the three kinds, given favourable conditions, can start the disease. The complaint seems to be spreading in many districts, and has engaged the attention of the experts of the United States Department of Agriculture.

Planters of tobacco should, therefore, when they discover weakness in their plants for which they cannot account, send carefully packed specimens to their nearest investigation station, and ask for information thereon, and what remedies should be used to exterminate the trouble.

DR. WIDTSOE, President of the Agricultural College of Utah, and well known as an authority on dry-farming, in acknowledging receipt of the April number of *TROPICAL LIFE*, containing an article on his book "Are Dry-Farming Methods an Advantage in the Tropics?" wrote:—

"I believe you are perfectly right in your applications to tropical agriculture. Dry-farming, after all, is little more than good farming in which little things are well looked after. That method should be of value anywhere in the world."

THE French Consul at Rio is said to have reported on the excess cost of living in Rio as compared to Paris as being equal to 3.5 to 1, so that an employé earning fr. 495 a month in Rio can scarcely live as one who earns fr. 200 in Paris, and certainly cannot save on such pay.

Cotton.

THE following were the prices for Cotton in London on August 7th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1912.		Compare Good, 1911.		per lb.
	d.	d.	d.	d.	d.	d.		d.	d.	d.	d.	
Surat kinds* ...	5 $\frac{5}{16}$	to 5 $\frac{1}{2}$	5 $\frac{9}{16}$	to 5 $\frac{3}{4}$	5 $\frac{13}{16}$	to 6 $\frac{1}{16}$	—	6	to 6 $\frac{3}{16}$	5 $\frac{7}{8}$	to 6 $\frac{3}{16}$	—
Madras ...	5 $\frac{3}{4}$	to 5 $\frac{7}{8}$	5 $\frac{3}{16}$	to 6 $\frac{1}{8}$	—	—	—	5 $\frac{1}{8}$	to 6 $\frac{7}{16}$	5 $\frac{7}{8}$	to 6 $\frac{1}{2}$	—
Bengal ...	—	—	5	—	5 $\frac{1}{4}$	—	5 $\frac{3}{8}$	5 $\frac{5}{8}$	—	5 $\frac{1}{8}$	—	—
Assam ...	—	—	5 $\frac{5}{16}$	—	5 $\frac{11}{16}$	—	5 $\frac{7}{8}$	6 $\frac{1}{8}$	—	5 $\frac{3}{8}$	—	—
China ...	—	—	5 $\frac{1}{2}$	—	5 $\frac{3}{4}$	—	6	6	—	6	—	—
West Indian ...	6 $\frac{3}{4}$	—	7 $\frac{1}{4}$	—	7 $\frac{3}{4}$	—	8	8	—	8 $\frac{1}{8}$	—	—
Sea Island ...	12 $\frac{1}{2}$	—	15	—	18 $\frac{1}{2}$	—	22	14 $\frac{1}{2}$	—	13 $\frac{1}{2}$	—	—
West African ...	5 $\frac{11}{16}$	—	6 $\frac{1}{4}$	—	6 $\frac{7}{16}$	—	—	7 $\frac{1}{8}$	—	6 $\frac{1}{2}$	—	—
East „ ...	6 $\frac{7}{16}$	—	7 $\frac{1}{4}$	—	9	—	—	7 $\frac{7}{8}$	—	7 $\frac{5}{8}$	—	—

* Liverpool quotations.

In consequence of the holidays this has been a short and quiet week. The Bureau Report issued on Friday last gave an average condition to July 25th of 79·6, against 81·8 last month and 76·5 last year. Although less than generally expected, this had no effect upon the market, and prices show a fall of 6 to 5 points from last week. Trade is dull, and attention is mainly directed to the daily Crop Reports. East Indian is easier. Silver 27 $\frac{1}{4}$ d. per oz.

The import into Liverpool this week amounts to 19,211 bales, since September 1st 4,577,006, same week last year 12,987, last year's total 5,047,488 bales. The estimated Sales amount to 31,000 bales, including "called." Middling American is quoted at 6·49d. per lb., last year 7·09d., 1911, 6·80d.

Movement of American Cotton since September 1st :—

	1912-13.	1911-12.	1910-11.	
Brought into sight ...	13,494,000	15,675,000	11,700,000	bales
Exports from United States since September 1st—				
To Great Britain ...	3,543,000	4,183,000	3,292,000	—
To Continent, &c. ...	4,473,000	5,619,000	3,967,000	—
Total crop ...	—	16,138,000	12,120,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	August 8th.	Same time 1912.	Same time 1911.	
	d.	d.	d.	
August ...	6·22 $\frac{1}{2}$	6·83	6·45	per lb.
Aug.—Sept. ...	6·14 $\frac{1}{2}$	6·76	6·29 $\frac{1}{2}$	—
Sept.—Oct. ...	6·05 $\frac{1}{2}$	6·67	6·07 $\frac{1}{2}$	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

PUBLIC sales were resumed on August 7th and the moderate quantities of all descriptions offered met with a good demand at fully steady prices. The stocks in the principal ports of Europe on August 1st showed a decrease for the month of 88,000 bags against a decrease of 197,000 bags at the same time last year, and the visible supplies on the same date showed an increase of 207,000 bags against an increase of 70,000 bags in 1912. Owing to larger receipts and depressing advices from the Continent and New York, "futures" declined, and though there was some recovery from the lowest point, the latest prices were 1s. 4 $\frac{1}{2}$ d. lower for the week. We quote :—

		To-day	July 31st, 1913
London ...	Santos, Sept. del. ...	41s. 10 $\frac{1}{2}$ d. ...	43s. 3d.
New York ...	No. 7 Rio „ ...	8·73 cents ...	9·08 cents
Hamburg ...	Santos „ ...	46 $\frac{3}{4}$ pf. ...	48 pf.
Havre ...	Santos „ ...	58 $\frac{3}{4}$ francs ...	60 francs

The receipts at Rio and Santos from July 1st to August 6th, 1913, were 1,386,000 bags, against

1,175,000 bags and 1,340,000 bags in the two previous years respectively.

Sales include the following, viz. :—

East India.—Nilgiris, at 65s. for smalls, 72s. for middling, 75s. for bold.

Costa Rica.—At 70s. per cwt.

Guatemala.—At 57s. 6d. to 64s. for good ordinary to low middling, 68s. to 73s. for bold.

Salvador.—At 56s. for smalls, 69s. 6d. for bold.

Nicaragua.—At 53s. to 53s. 6d. for foxy greenish.

Colombian, &c.—At 57s. to 58s. for smalls, 61s. to 67s. for fine ordinary to low middling, 65s. to 73s. for fine ordinary to good middling bold, 82s. for fine bold.

Later sales included: Middling greenish Costa Rica, 73s. 6d. to 74s. Low middling greyish Guatemala, 65s. 6d.; bold fair to good greenish and greyish, 70s. to 76s. Ordinary to good ordinary brownish Vera Paz, 54s. to 58s.; pea-berry, 53s. to 56s. 6d. Bold fair to good greenish Nicaragua, 69s. 6d. to 76s.; fine, 84s. 6d.; pea-berry, 77s. to 83s. 6d. Low middling Mexican, 64s. to 64s. 6d.; fair bold, 67s. Fair to good greenish and greyish Colombian, 70s. to 78s. 6d.; fine coloury, 84s. 6d.; pea-berry, 66s. to 75s.

Sugar.

SUGAR has been further stimulated this week, reported Mr. C. Czarnikow on August 7th, not by adverse crop reports, but by a rise in New York from 3.61 to 3.73 cents = 2.37½ cents or 10s. 10½d. c.f. Cubas or 9s. 4½d. Javas, thus about 8s. 4½d. f.o.b. Hamburg, which is still a long way off our values. Yet holders were encouraged to raise limits because prices were rather low and because there is a possibility of some Cubans going back from Europe, of which, however, there are not many available. As the August tenders were moderate as long as a premium of 3d. or more on new crop prevailed, we have reduced that premium back to 1d. (August, 9s. 3¼d.; October-December, 9s. 4¼d.), which should bring out more tenders, unless it suits holders to play with them a little longer. They only risk a very moderate amount of interest. For the week we advanced August from 9s. 0¼d. to 9s. 3d., October-December from 9s. 3½d. to 9s. 4¼d.; whilst in actual sugars, business in 88 per cent. was done at the parity of 9s. 3d. to 9s. 5d. f.o.b., second runnings being quoted nominally at 7s. 6d. f.o.b.

In Europe the weather has been drier and warmer, as desired in most districts, except in some parts of Central Germany. Licht certainly reports very favourably, especially regarding crops in heavy soils. In Western Europe, viz., Belgium, Holland, and especially France, the roots are a week or two backward compared to last year, but the weight of leaves shows that with fair weather much could be made good. Of course, last season's yield in France has always been taken as exceptional in estimates which are not based thereon.

The American market has become very firm, and the quotation for 96 per cent. Centrifugals has advanced to 3.73 cents = 10s. 10¼d. c.i.f. United States, and even thereat very little is offered. In the United Kingdom there has been an improved demand for refining grades of Cane Sugar, but supplies are upon a very limited scale. For the few parcels which have changed hands a slight advance has been obtained. Owing to the Bank Holiday there were no auctions of grocery Crystallized during the week, but privately a fair business has been done at previous rates.

As regards Cane-producing countries, mail advices report that in Louisiana rains have been general throughout the Sugar district, accompanied at times with heavy winds. No damage, however, has been reported. The rains, however, have hindered field work. From Australia we hear that the prospects in Queensland and Fiji continue satisfactory, although wet weather in the former is interfering with field work, tending to prolong the season, though not likely to curtail the output. In Cuba rain is desired for the next crop.

The total transactions for the week amount to about 4,000 bags British West India, including Crystallized Trinidad, low yellow to middling ditto, 14s. to 14s. 6d. duty paid; fine yellow and pale, 15s. 6d. to 16s. Crystallized St. Lucia, good yellow and pale, 15s. to 15s. 3d. Crystallized Jamaica, dry pale, 14s. Crystallized Antigua, good yellow, 15s.; 400 bags yellow Crystallized Mauritius also sold at 15s. 6d. duty paid.

Coco-nut Products, &c.

JULY closed, according to Messrs. Mordaunt Bros., with an advancing market for coco-nut oil, with a large business doing at 6d. to 9d. on mid-July rates, Cochin being quoted at 46s. 9d., and Ceylon 45s. 9d. to 46s. 3d., against 45s. 9d. to 46s. f.o.b. Hamburg for palm kernel oil, and 33s. 3d. to 33s. 6d. for Lagos palm oil, the latter product showing 6d. to 1s. rise. For the week ending August 8th the coco-nut oil market was slightly easier, and prices for shipment down 5s. a ton all round, but palm oil was firm and had advanced 5s. Prices generally on August 9th ran as follows:—

<i>Palm oil (Liverpool):</i>		1913	1912	1911
Per cwt.				
Lagos	... 34s. 6d. to 34s. 9d.		29s. 6d.	30s.
Benin	... 31s. 3d. to 31s. 6d.		28s.	28s.
Congo	... 28s. 3d. to 28s. 9d.		27s. to 27s. 3d.	25s. 6d.
Bleached	... 35s. 6d. to 36s.		32s. to 33s.	32s.
Clarified	... 31s. to 31s. 9d.	28s. 6d. to 29s. 6d.		28s. 6d.
<i>Palm kernel oil</i>	45s. 9d. to 47s.	35s. 6d. to 38s. 6d.		35s. 6d. to 37s.
<i>Coco-nut oil:</i>				
Cochin	... 59s. to 60s. 6d.	44s.		41s. 6d. to 42s.
Ceylon	... 48s.	38s. 6d.		40s.
English pressed	None	35s. 3d.		36s. 6d.
<i>Copra oil:</i>				
Ceylon	... None	39s.		40s.
Cochin	... 50s. 6d.	42s.		41s. 6d. to 42s.

According to the *Public Ledger* of August 8th, prices ruled as under (per ton):—

Soya Oil.—Hull: Naked extracted spot, £27 10s.; September-December, £27 10s.; January-June, £26 15s. Oriental easier. July-August, £26 5s. c.i.f.; August-September, £26 2s. 6d. c.i.f.; September-October, £26 2s. 6d. c.i.f.; October-November, £26 c.i.f.; November-December, £25 12s. 6d. c.i.f.

Coco-nut Oil easier. Ceylon spot, £51; August-September, £47 10s. c.i.f.; September-October, £47 10s. c.i.f. Cochin spot, £58; August-October, £50 10s. c.i.f.

Palm Oil lower. Lagos on spot, £37 10s.

Palm Kernel Oil.—August, £46 5s.; September, £46; October-December, £45 10s. f.o.b. Hamburg.

Soya Oil Beans firm. Parcels Harbin spot, Hull, £8 17s. 6d.; September-October, £8 17s. 6d.; November-December, £8 11s. 3d.; December-January, £8 7s. 6d.; January-February, £8 7s. 6d.

Linseed Cakes.—London made, £7 10s. to £7 12s. 6d.

Cotton Cakes.—London made, £5 15s. to £5 16s. 3d.

Copra dull. Malabar, August-October, £33 sellers, and October-December, £32 Hamburg. Ceylon, June-August, £33 sellers Hamburg. Java, June-July, £32 sellers; July-August, £31 15s.; July-September, £31 5s.; August-October, £30 15s., and October-December, £30 10s. Holland, Hamburg and Bremen. Macassar, June-August, £31 15s. sellers, and July-September, £31 10s. Holland, Hamburg and Bremen. Singapore, June-August, £32 5s. sellers Hamburg. Cebu, July-September, £31 5s. sellers Hamburg. South Sea Island, July-August, £31 5s. sellers London. F.M. Straits, June-July, £31 value; July-August, £30 17s. 6d. Marseilles. Manila, July-September, £29 17s. 6d. sellers; August-October, £29 10s., and October-December, £28 15s. paid Marseilles. Mixed no Padang, June-July, £30 10s. value; June-August, £30 2s. 6d., and July-September, £30 Holland, Hamburg and Bremen, all c.f. and i. delivered weight.

Messrs. Goodlake and Nutter report that Ceylon oil keeps very firm, although there has not been quite so much inquiry during the past week. Sellers do not seem inclined at the moment to meet buyers' views, and it looks as if the latter will have to improve their bids. We quote July-September New York 48s. 6d., and August-October, 48s. 3d.; July-September, London 48s., and August-October, 47s. 9d. Cochin: There is practically no inquiry. We quote 41s. 6d. August-October shipment. Palm kernel oil has declined in sympathy with kernels, but we think this is but a temporary movement, as there is a fairly big inquiry. We quote August, 46s.; September, 45s. 10½d.; and October-December, 43s. 9d. Small parcels, however, are being offered for near positions at a little less money, but we do not think any quantity could be obtained. Pressed oil very inactive. We quote near, 46s.; September, 45s. 6d.; and October-December, 45s. 3d. Spot prices: Ceylon, £49 10s. to £51 10s.; Cochin, £56 to £58.

The India-rubber Market.

HARD FINE 3s. 10d. PER LB.; PLANTATION UP TO 2s. 9¾d.

THE end of August found the Pará market at Liverpool firmer for the week ending August 8th, with sales of about 75 tons, including hard fine spot 3s. 8d. to 3s. 9d.; August, 3s. 6d. to 3s. 9½d.; and August-September, 3s. 4d. to 3s. 6¾d.; also Caucho ball spot 2s. 0½d., and Cameta at 1s. 6d. per lb. Medium Brazilian grades have continued more or less neglected. No sales of interest have been reported in *African* during the week, and the market has remained in a lifeless condition.

In London the firmer tone, said the *Public Ledger* of August 8th, noticed in the Pará market a week ago has been more than maintained during the week and Hard Fine closes 2d. to 2½d. dearer with little offering, and with only a moderate spot business at 3s. 9½d. to 3s. 10d., closing 3s. 10½d. value.

Other business or values include:—

Negroheads.—Scrappy Manaos is firmer at 2s. 2d. nominal; and Islands, 1s. 5d. to 1s. 6d.

Bolivian.—Fine nominal 3s. 9½d.

Peruvian.—Fine value 3s. 7½d.

Caucho Ball dearer, with a small business on the spot at 2s. 1d.; closing buyers at 2s. 1½d., and forward at 2s. 2d.

Mollendo.—No sales reported. Fine quoted nominally 2s. 11½d.

Plantation has also been firmer, but closes quieter and a little below the best. A considerable business has been done for spot and August delivery in Standard quality No. 1 Crêpe at 2s. 9¼d. to 2s. 9¾d., but chiefly at 2s. 9½d.; August-September delivery also sold at 2s. 9¼d. to 2s. 9½d. and sellers; October-December, 2s. 9¼d. to 2s. 9½d. to 2s. 9d. and value; January-March (1914) at 2s. 8¼d. and value; and January-June at 2s. 8¼d. and value.

Prices at this month's sales showed a ¼d. to ½d. advance for first latex and smoked sheet on last auction's rates, whilst brown and dark grades were 1d. and 2d. lb. up. As the sales progressed there was again a slight advance, and the closing prices were very steady, say: Crêpe, fine blanket, 2s. 9½d. to 2s. 10d.; No. 1, 2s. 9¼d. to 2s. 10d.; light and

mottled, 2s. 8½d. to 2s. 9¼d.; good light brown and brown, 2s. 7d. to 2s. 9¼d.; fairly clean brown, 2s. 5½d. to 2s. 7d.; dark brown, part specky, 2s. 3d. to 2s. 6½d.; dark and black, 2s. 3d. to 2s. 5½d.; specky and barky, 1s. 11½d. to 2s. 5d.; soft and pressed, 1s. 8½d. to 2s. 1¾d.; good smoked, 2s. 8d. to 2s. 9d. per lb. Biscuit and sheet, No. 1, 2s. 8¾d. to 2s. 9¾d.; mouldy and stuck, 2s. 8d. to 2s. 8¾d.; fair to good smoked sheet, 2s. 10¼d. to 2s. 11d.; mouldy ditto, 2s. 8¼d. to 2s. 10d. per lb. Scrap, fair to good, 1s. 7¼d. to 1s. 8½d. per lb. Rambong, Crêpe, 2s. 2d. to 2s. 4d. per lb. Lanadron block, 2s. 8¼d. per lb. Crêpe, cured by "Byrne" process, 2s. 8½d. to 2s. 9¼d. per lb.

Pará rubber statistics for the month of July (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará ...	1,430	690	= 2,120 agst.	1,940	1,420	2,330
Shipments to Europe	560	390	= 950	„	1,320	1,150
„ „ America	690	260	= 950	„	1,170	910

Crop statistics, June 30th, 1912, to June 30th, 1913 (twelve months):—

	Pará.	Caucho.	1912-13.	1911-12.	1910-11.	1909-10.	1908-9.
Pará {	1912-13	32,290	9,660	41,950	39,360	37,500	39,130
Receipts {	1911-12	32,230	7,130	39,360	37,500	39,130	38,090
„ Shipts. Europe	17,050	6,720	23,770	20,260	19,910	21,860	19,200
„ „ America	16,230	3,300	19,530	20,570	13,570	17,040	19,050

The London Cocoa Market.

By THE EDITOR.

As, I believe, I have already suggested, it may be interesting to watch between now and the end of 1914, that is seventeen months hence, how the position of the supply and demand of raw cocoa has been maintained, both of the world as a whole and of individual producing and consuming centres. Complaints have been rife of the unsatisfactory out-turn of some of the parcels of Bahias that have come forward. As that centre has been so troubled with drought one knew at once that the beans could hardly have been weathered or mouldy; the trouble, as we expected, lies in their either being wormy or small and hard, sometimes, no doubt, both. The last, of course, is due to lack of moisture and plant food, as without the water necessary to conduct the nourishment to the beans in the pod, their growth is naturally stunted, whilst the weavils betoken the inclusion of old stock held for higher prices, or other reasons, that have been steadily drawn upon for some months past. This anyone who has been following the statistics of receipts and exports at Bahia City well knows. In spite of such facts and the accompanying reduction of invisible stocks, the output of cocoa from Bahia, including, of course, these reserved supplies that cannot be replaced, has been much below last year instead of larger, as one would naturally expect (115,234 bags January-June, against 160,448 last year, and 241,311 bags in 1911), so what the regular consumer who is dependent on this growth has to ask himself is, "What will the exports from Bahia amount to, with the drought restricting both quality and quantity of the output, and no stock to fall back upon as shippers have had the advantage of during the past year?" This is one of the interesting problems to watch; another will be the Trinidad output, and the effect of the drought there on future outputs and

prices. At the moment the American demand is slack, but we all know how uncertain that market is, and the very fact of the demand temporarily being unsatisfactory from the planter's point of view can cause him to look for better times at any moment. Nowadays cocoa seems more liable to become wormy than formerly (by the way, is it that with shorter periods of fermentation they are more liable to the pest?), and so it seldom seems to benefit the importer to hold, for even if the price sometimes goes up, the quality seems to always go down; still, I hear that those who have fine Trinidads that will keep have refused to sell, or even to offer their cocoa in the present mood of the market. Talking of holding and of cocoa becoming wormy reminds me that another growth that should be interesting to watch are Guayaquils. Are the producers of this growth (which has, like Venezuelan, always been rightly considered as a growth apart) growing frightened as to the future prospects of their cocoa? Is the present demand for cocoa and chocolate generally throughout the world tending to cause Guayaquils to be taken up less freely in proportion to the heavy increase in their output? Would it be wiser for the planters or manipulators of this growth to sell the cocoa more quickly, so as to have less loss over defective and weavily beans, to say nothing of interest, rent, charges, &c.? If this last question be answered in the affirmative, how could the large output of this growth, which is not used by everybody, and is not easy to substitute for the general run, as Bahias, Trinidads, West Coast, &c., be disposed of to best advantage? Would it be wise to sell, say, half or three-quarters of the crop at "current prices," and keep the balance for better rates, with the idea of reducing the loss by beans being spoiled through keeping, whilst, at the same time, possibly new channels of demand would be opened up for this excellent cocoa by placing it more on a parity with the "lower orders"? Meanwhile, up to the time of writing (August 18th), we are still without any statistics of the Gold Coast output from Liverpool, but M. Anthime Alleaume at Havre tells us that for January-June the exports amounted to 25,000 tons (of 1,000 kos.), against 18,000 last year and 17,000 in 1911. Taken roughly at 2 lb. to the kilo, this means 50,000,000 lb. received in the half-year, against 36,000,000 lb. last year and 34,000,000 lb. in 1911, out of 89,205,663 lb. as the total export for 1912 (21,829,000 lb. in December only) and 89,482,226 lb. in 1911 (18,890,000 in December only).* Those interested in this crop can, therefore, estimate what the total output for this year is likely to work out at. It is rather strange that, in spite of this increased output, Havre did not receive a bag of Accra kinds during July, neither did she in May, whilst April only brought some 900 bags; America, on the other hand, for January-June, is reported to have taken 159,000 bags of African (*i.e.*, I take it, San Thomé, Gold Coast, and others), against 136,000 bags last year and 114,000 in 1911, whilst the total American imports run less than last year, 632,000 bags, against 689,000 and 610,000 bags in 1911.

* According to Messrs. C. M. and C. Woodhouse and Co. these are only the Jan.-May figures, which they give as being 50,976,200 lb. against 36,579,500 lb. last year, and 37,238,200 lb. Jan.-May, 1911.

Coming now to movements, the following are the stocks in Havre (7,000 bags less than on June 30th) and London, according to latest figures available:—

			1913.	Value.	1912.	Value.
<i>Havre Stock, July 31st—</i>			Bags.	Fcs.	Bags.	Fcs.
Pará ...	...	13,031	82 to 86	6,890	81 to 84	
Bahia ...	...	9,881	79 ,, 86	6,624	75 ,, 84	
Venezuela ...	...	59,036	84 ,, 185	52,659	81 ,, 200	
Trinidad ...	...	25,429	84 ,, 89	35,540	84 ,, 90	
Grenada and O.W.I.	...	2,963	81 ,, 85	4,754	72 ,, 93	
San Thomé ...	...	4,175	84 ,, 86	5,909	76 ,, 78	
San Domingo ...	...	7,344	73 ,, 78	10,261	70 ,, 74	
Haiti ...	...	6,204	69 ,, 79	10,201	61 ,, 74	
Accra ...	...	49,746	76 ,, 79	53,596	70 ,, 74	
Guayaquil... ..	...	16,290	80 ,, 88	19,288	73 ,, 82	
Others ...	...	13,821	—	6,451	—	
Totals ...	207,920 bags				212,173 bags	

			1913.	1912.
<i>London Stock, August 9th—</i>			Bags.	Bags.
Trinidads ...	...	11,645	...	6,721
Grenadas ...	...	6,476	...	5,958
Other W.I. ...	...	4,318	...	13,320
British Africa ...	...	10,961	...	8,010
Portuguese Africa...	...	4,008	...	8,482
German Africa ...	...	2,898	...	7,070
Ceylon and Java ...	...	16,293	...	15,221
Guayaquil ...	...	13,207	...	42,507
Brazil and Bahia ...	...	439	...	2,726
Other Foreign ...	...	9,531	...	9,310
Totals ...	79,776	...	119,325	

The Board of Trade figures for the United Kingdom to the end of July are chiefly remarkable for the fact that for once the deliveries of foreign manufactured show a falling off and not an advance; all the same, whilst the seven months' deliveries of raw cocoa for Home consumption show only 871 tons increase, that for foreign manufactured are 978 tons ahead of last year. Here are the figures:—

<i>Raw Cocoa only—</i>	Landed.	Del'd H.C.	Exported.	Stock (July 31st)
Jan.-July, 1911—	22,216	14,288	3,629	13,774 tons
" " 1912—	22,015	15,629	3,586	12,262 "
" " 1913—	22,717	16,500	4,346	10,968 "
Incr.	702	Incr. 871	Incr. 760	Decr. 1,294 "

In July only 2,221 tons were delivered for Home consumption, against 2,037 tons last year and 2,687 tons in 1911.

With foreign manufactured the returns are:—

	Landed.	Del'd H.C.	Landed.	Del'd H.C.
	July only.		Jan.-July.	
1913—	760 ...	729 ...	6,659 ...	6,365 tons
1912—	774 ...	800 ...	5,189 ...	5,387 "
1911—	574 ...	572 ...	4,316 ...	3,934 "

Up at Liverpool 21,186 bags were landed in July, against 21,081 delivered. Crossing to Lisbon, the stock there has increased another 10,000 bags, say:—

	Bags.
Stock on June 30th...	62,488
Landed in July ...	34,652
	97,140
Delivered in July ...	24,216
	72,924
Leaves stock on July 31st, 1913 ...	72,924
Against " " 1912 ...	94,924

At the end of April it may be remembered that this Port carried only 33,730 bags as its stock. On the other hand, the exports from San Thomé have been:—

SAN THOMÉ SHIPMENTS (LISBON RECEIPTS).

	1913	1912	1911	1910
Jan.-July ...	245,004	287,515	288,755	314,012 bags

Those who claim that San Thomé has seen its best days as regards output owing to the clearing of the original forests having reduced the rainfall, and the natural fertility of the soil being depleted, might point to above figures to prove that their assertion is correct.

As regards prices and values, these, up to the time of going to press (August 19th), are given below, but some allowance must be made when discussing the following quotations for (1) the time of year; the holidays and slack season being in full swing; (2) the anxiety of buyers to pull down prices by keeping out of the market as much as possible; (3) the opinion of sellers, claimed to be based on statistics and crop prospects, of a future scarcity of supplies, and consequent improvement in values; and (4) the fact that no sales took place in London on August 5th, whilst those of the 12th were not of a nature to "make a market." With these notes, I make present values as follows, and base them partly on prices realized, partly on valuations or reserve prices:—

Trinidads.—Good reddish sold at 76s., and fine red, which seems unable to realize little, if any, more than mid. or good mid. red, have, I understand, been withdrawn until the market goes above the following: good mid. red, 72s. to 74s.; good to fine good red, 75s. to 76s.; fine to superior, 76s. to 77s. (nominal).

Grenadas.—Very few sales. 70s. and 71s. was touched at the auctions on the 12th, and many want to value good to fine marks at 67s. to 69s. As the crop is over 10 per cent. behind last year (61,560 bags against 68,634) and prospects none too good, a more or less fluctuating rise seems the most likely thing to happen.

Jamaicas.—Fair to good reddish sold at 65s. to 66s. on the 12th, but picked lots are worth the same as fine Grenadas and common unfermented to fair fermented, 63s. to 64s.

Dominicas.—A fine lot realized 70s.; good reddish, 64s. 6d.; good bold red, 66s. 6d.

St. Lucia.—Fine should realize 69s. or 70s., whilst good red sold at 67s., fair reddish 65s.

Costa Ricas.—Good reddish have just been sold at 67s., and last sold (in July) at 67s. 6d.

West Coast Africa hangs fire, buyers holding aloof. Liverpool quotes African kinds at 52s. to 66s., against 50s. to 64s. last year, and in London fair average quality to good fermented are quoted at 60s. to 64s.

Cameroons and San Thomé are valued at 67s. to 68s. according to quality.

Panama.—Fine bold sold at 106s.

Venezuela unclayed sold at 78s., against 87s. 6d. for good clayed Puerto Cabello.

Samoa.—Good bold is worth about 78s.

Java.—Fine bold last sold at 92s., against the previous sale of 96s. At the moment such cocoa would probably realize only 88s.

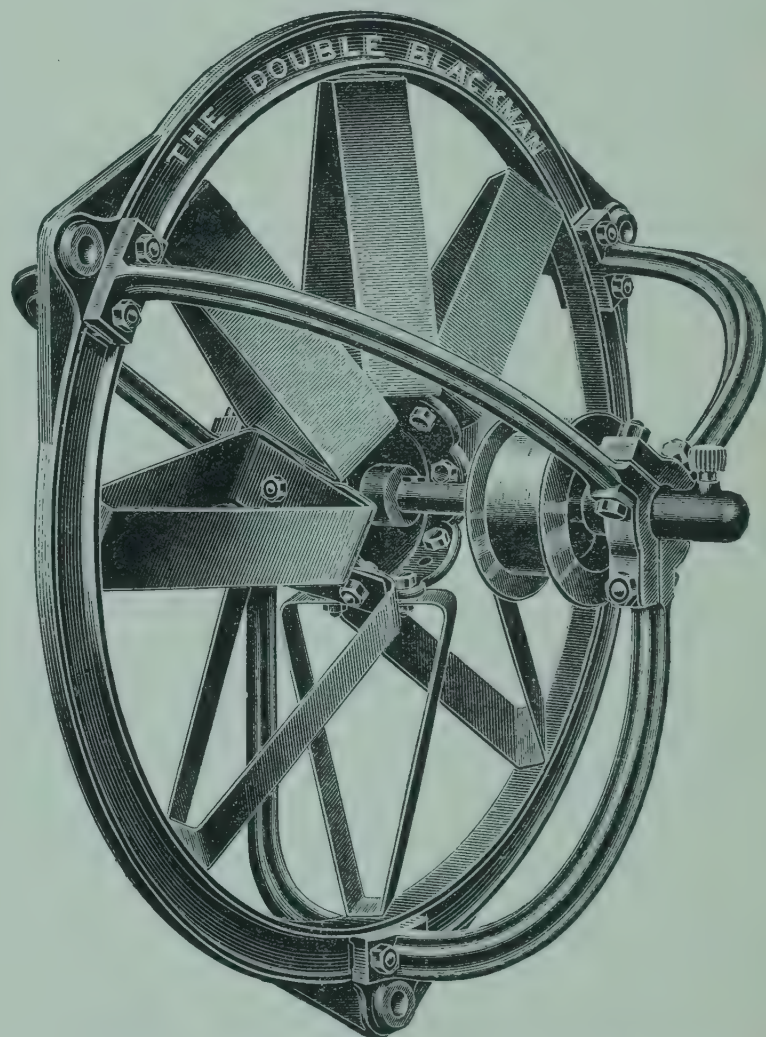
Guayaquils.—Arriba is valued at 74s. to 79s.; Machala, 70s. to 74s.; Caraquez, 72s. to 76s. Small sales include fine summer Arriba, 78s.; fair Arriba, 75s.; and Machala, 72s.

Ceylons.—Fine marks are worth 88s. to 92s.; fair to good medium, 75s. to 87s. 6d.

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"THE FERMENTATION OF CACAO" MUCH APPRECIATED.

WHILST up to the time of publication orders on hand for "The Fermentation of Cacao" were not so heavy as those received to a similar period for the "Coco-nut Book," since publication repeat orders for three, four, five and more copies have been received from those who, having seen one book, immediately ordered the others to send to their friends and employees abroad. This shows that the book is meeting the requirements of those interested in the production and shipment of cacao from overseas, and points to the entire edition speedily becoming exhausted* when those in the Tropics learn of and see the contents.

We are glad to see how fully our readers agree with the remarks in the preface as to the necessity of more recognition on the part both of the authorities and the general public of the importance of the tropical planter to their factories and homes if the trade of this country is to be maintained, and the need of organizing systematic scientific research and investigation in all that has to do with tropical planting and its allied industries. "I am glad to see the remarks on pp. xlii to xliv of your preface," writes one correspondent, "especially where you call attention to the way in which the Exchequer derives increased taxation from the recent development of the Tropics and the public earn more money and receive larger supplies of food, and yet in return for this they have hitherto given nothing, and the public at least are generally unaware of what they owe to the Tropics. Even the authorities are not free from blame, as we were reminded by the speech made by the Chairman of the Indian Tea Association at their meeting in London on July 15th, when he is reported to have said, 'I expect a good many of us are of opinion that we, who in this matter have been in advance of our own Government, are paying more than our share of the cost. . . . I sometimes wonder whether, if science had been called in earlier, indigo might not have been saved in Behar and coffee in Ceylon.' The public seem to imagine that if an individual planter or centre is overwhelmed by a pest or other misfortune it does not matter, since there are plenty of others in existence to secure supplies from. If the authorities or the Government, however, consent to run the Empire on these lines they will soon come to grief. The same as the public, the scientists and the Government in England, by ignoring Perkins and his wonderful inventions in con-

* As has been the case with the "Coco-nut Book," of which the last copy was sold towards the end of August. We did not intend issuing a second edition, but as we have orders unexecuted for well over one hundred copies from the Tropics alone, we are considering the matter.

nection with dyeing, caused this country to lose an important trade, so can the continued neglect of the Tropics and the refusal to vote money to carry out scientific research work over there to consolidate and extend the industries sooner or later rebound on the selfish ones at home, who grab all and want to give nothing in return. For this reason I wish you every success in your endeavours to secure an Agricultural College and Institute of Scientific Research in the West Indies, as well as in the East, for work carried out on the basis of your book on cacao, in connection with the cultivation and preparation of sugar, coffee, cotton, coco-nuts, rubber, &c., as well as attending to their pests and diseases, would be bound to give a tremendous impetus to the trade of this country with the Tropics, and repay the cost many times over."

The Prevention of Moisture and Hot, Stagnant Air in Tropical Houses.

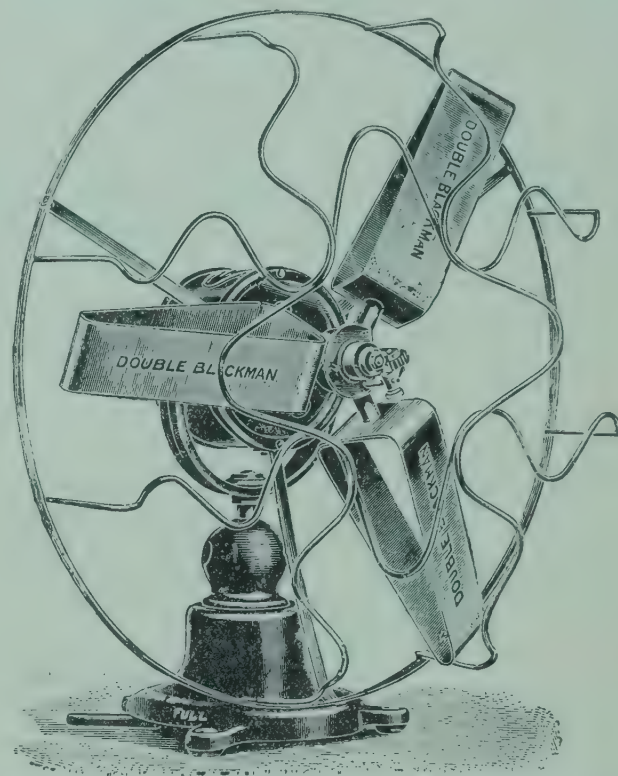
OLD TIMERS in the Tropics know what tortures they have endured to body and mind, but especially the latter, through damage from damp, heat and vermin to the contents of their houses, factories and office, damage often irretrievable in the case of books, or samples spoiled, in spite of all the care and precautions taken to keep the articles intact. Of all evils the existence of moisture is the greatest, as it causes mildew to spread far and wide, spoils metals speedily, and renders cooked food unfit for consumption. "Many industries," reported the *Indian Trade Journal*, "are completely stopped in India during the wet season, mainly on account of the lack of proper appliances for drying; and the cigar industry has failed in some instances, through inability to remove the moisture that had been imparted to the leaf, and so render it adaptable to machine manipulation." Yet all this can be effectually and economically avoided, and those engaged in industrial undertakings should and must see to it that their factories and offices (leaving private residences out of the question for the moment) are properly ventilated and kept cool and dry. As we urged in our book on "Soil and Plant Sanitation," much could be done as regards coolness and cleanliness, the avoidance of angles, corners, &c., by the use of cork-boarding, which can keep heat out, the same as it keeps it in, and is certainly an advantage to jacketed walls, which harbour all pests and filth imaginable, until their objections exceed their advantages. Hollow concrete blocks, when possible, should also tell for coolness and minimize risk of fire; but in any case, in order to prevent the effect of dampness, circulation of the air must be arranged for, and for this reason fans will have to be used much more freely in the future than they have been in the past.

An idea that is attracting attention, whether it is adopted or not, is for the still air of the double or jacketed walls to be replaced by artificially cooled air circulated between the inner and outer walls by means of fans; the cooling of the air is effected by drawing it through a wetted screen. By some such process it is claimed that the heat can be carried away and dampness avoided as fast as it is generated.

We find difficulty, however, in supporting such a proposition for keeping tropical houses cool and dry. Cooling warm air by passing it through a wetted screen

may temporarily cause a pleasanter temperature, but at the same time it adds humidity, which must make matters worse, because nature's own means of cooling, viz., the evaporation of perspiration, is less effective in a humid atmosphere. It would be almost better to light a fire in the room and so make the air relatively drier than to seek to cool it by contact with water. But then neither course is necessary; surely fans can both adequately cool as well as dry the room.

Coming to the question of the fans to be used, the new patent Blackman intermittent fan seems to us to embody



The Blackman Intermittent Fan for keeping Tropical houses dry and cool.

many advantages over the usual fixed bladed type, since in place of the usual continuous or sweeping draughts, it creates breezes which gently rise and fall in the most natural manner possible. They come and go at intervals which can be changed at will; they can also be made to blow in one direction intermittently or in both directions alternately, the latter movement having the effect of a punkah. For pleasure and profit, therefore, these fans, of which we show an illustration, should, we imagine, be found extremely useful for keeping tropical houses, offices, factories or warehouses free from hot, moisture-laden atmospheres.

As the intermittent breezes are obtained mechanically the fans need no attention; the reversing of the air currents and the changing of their intensity is accomplished by means of a gradual alteration in the angle of the fan blades, which are automatically and noiselessly controlled by a simple mechanism requiring no attention. Such a method, it is believed, would keep the rooms cooler, especially if lined with a non-conductor of heat like cork-boards, at a lower cost than with double walls as described earlier in this article.

Motors would be required to drive the fans, and it is estimated for buildings in the New Delhi that a moderate-sized house would require motors of one horsepower total, the cost of which is put at about one rupee a day, to which must be added the interest and depreciation on the cost of the fans.

For individual comfort we would remind readers that the best, in fact the only healthy and safe way to keep cool in the Tropics is to perspire, and have the surrounding atmosphere in such a condition that the perspiration is quickly evaporated, and the air at the same time renewed and sweetened, this, too, at the minimum cost of time and trouble. This can be done by the above fan without subjecting those in the room to the risks of sitting in a draught whilst hot. We believe that such a fan would be particularly efficacious for the prevention of mildew and bacteria, simply by the avoidance of stagnation by constantly keeping the air in motion around and between the goods, so that the bacteria have no chance of thriving; and here the alternating currents will prove useful, as they search out and "lick up" the air and moisture from all directions and corners, and there is no doubt that the deposit of moisture on stored goods may be prevented, even when the air is practically saturated, by keeping up a constant movement. Like the London "bobby" with the public, all unsavoury subjects must "move on," or, better still for them, keep away altogether, and this can best be achieved by means of a fan.

Coco-nuts and Kapok in East Africa.

RECENT reports issued by the Nyassa Plantations, Ltd., show them to have some 2,000 acres under coco-nuts, of which the trees on the first-planted area have now been growing about twenty-two months and, despite an exceptionally dry summer last year, were said to be in very fine condition, whilst the losses are reported to have been only some 12 per cent. (against the customary 50 to 70 per cent. elsewhere on the East Coast of Africa).

Having some thousands of young palms in the nurseries available as supplies, any vacancies arising were made good, and the rainy season having commenced late and continued till April the last plantings have been done under favourable conditions. It is worth noting that a shipment of nitrate of soda and basic slag was sent out, and that parts of the plantation are being manured with these in varying proportions, and the results are being recorded for future guidance.

These coco-nuts extend for several miles along the coast, and a large area adjacent and further inland is now being acquired, and will be planted with rubber, cotton, soya beans, &c. If planted with Cear  rubber it is estimated that this land could be brought into bearing at a cost of probably as little as £10 per acre. It is also intended to plant caravonica cotton and kapok, as the latter, in addition to cotton, produces quantities of seed extremely rich in oil. The oil or fat from the kapok seed, soya beans, and coco-nuts may all be extracted by the same machinery. Planting these mixed crops, therefore, is not only economical, but the beans being an annual crop, and kapok yielding in three years* from planting, both would furnish sources of revenue before the coco-nuts come into bearing.

Those planting coco-nuts in these drier areas must, of course, catch and keep all the water they can. By cross

ploughing and drainage when it does rain, since the showers whilst they last are probably heavy, the water should be checked and made to sink into the soil instead of running away over the surface. A mulch laid in these furrows or drains is a great advantage, for it all helps to check the water and prevents evaporation when the rains are over. Cultivation and a dust or green mulch all assist to keep the moisture in the soil, whilst wind breaks, even with coco-nuts that like the breeze, also help, as by their shade they prevent excessive evaporation. These and many other little local "tricks" are worth at least a trial, for there is no doubt that the more moisture there is under the coco-nuts the larger your crop will be. Those outside the semi-arid belts would often be well advised to watch and adopt the methods of the dry-farmers, for all areas at times suffer from drought, and during the last two years the cacao and other estates in the full Tropics have suffered, often severely, owing to the long spells of dry weather with scorching winds to which the trees have been subjected between the rains. "The fundamental operations of dry-farming,"* Dr. Widstoe tells you, "include a soil treatment which enables the largest possible proportion of the annual precipitation to be stored in the soil. One of the chief attempts of the dry-farmer must be to see to it that the plants root deeply. This can be done only by preparing the right kind of seed-bed, and by having the soil in its lower depth well stored with moisture, so that the plants may be invited to descend. For this reason an excess of moisture in the upper soil when the young plants are rooting is really an injury to them, whilst, on the other hand, when the subsoil is fertile and furnishes a sufficient amount of water, destroying the surface roots is no handicap whatever."

The crops and areas referred to above by Mr. Widstoe are not cacao, coco-nuts, rubber, &c., in the Tropics, neither do we say that the above suggestions should be followed out word for word, but as explained in April (p. 74) and June (p. 113) issues, and again in June (p. 106) and May, 1912 (p. 82), we are certain that with cultivation and cross ploughing much surface water can be turned into the soil on estates, and not lost in the rivers where they often cause damage, whilst with mulching evaporation can be lessened. Having, therefore, the water in the soil, the roots must now be driven down by constant cultivation from the early planting, as Widstoe says, even from the days of the seed-beds, and so induced to seek the moisture below and not along the surface. Again, as pointed out also in the June (1913) issue, maybe before long nitrate of soda, which always increases the moisture in its neighbourhood, and other fertilizers can be applied at the same time by means of drills (especially with coco-nut soils) to go down nearer to the roots and the moisture, thereby counteracting the tendency of the roots coming up to them.

With regard to kapok, to a discussion of which a good deal of space has been devoted in the pages of our contemporaries of late, we have just received a forty-paged brochure on "The Kapok Industry,"† from the Depart-

* "Dry-Farming," by Dr. John A. Widstoe, President of the Agricultural College of Utah. Price 7s. 6d., post free. The Macmillan Co., New York and Toronto, or "TROPICAL LIFE," Publishing Department, London.

† "The Kapok Industry," by Murad M. Saleeby, being Bulletin No. 26, issued by the Bureau of Agriculture, Manila, Philippine Isles. No price mentioned. Postage would cost 1½d.

* Mr. Saleeby tells us that the first crop is usually produced from the trees between the third and the fourth years when reproduced from seed, and a year or more earlier when reproduced from cuttings.

ment of Agriculture, Manila, Philippine Isles. Mr. Saleeby, Chief of the Fibre Division, and author of the book, claims that the natural conditions in these islands are on the whole entirely favourable for the cultivation of this crop, and with the increased demand for the floss for upholstery and life-saving appliances remunerative prices are looked for. The climatic conditions which directly affect the growth of kapok, and the development of its fruit and floss are three, viz., the degree of temperature, the tree requires a warm climate; the amount of rainfall, the tree does not require a large amount, nor an even distribution of rainfall; and the absence of strong winds which injure the long, heavy, horizontal branches.

The seeds yield about 20 per cent. of oil, and the cake can be used with advantage as cattle feed and as a fertilizer. The weight of the seed is, roughly speaking, double that of the floss, and on the basis of rates ruling at the close of 1912, or the beginning of this year, Mr. Saleeby estimates that a hectare of land in the Philippines, planted to kapok under seven years of age, will yield 800 to 900 kilos of seed per year, valued at P. 28 to P. 31.56 ($P = 2s. 0\frac{1}{2}d.$). At the same time a very wide divergence is encountered in yields, both in the number of pods to the trees (350 to 400 and even 600 pods in extreme cases) and the yield of floss per pod (150 up to 300 pods = 1 kilo floss, with a probable average of 230 pods to the kilo). The judicious selection of seed from uniform pods will undoubtedly increase the average yield of floss in the pods.* On the above basis a hectare planted in kapok and containing 280 trees (about 110 to the acre) ought to yield 95,000 to 110,000 pods, which at the rate of 230 pods to the kilo, will yield 410 to 480 kilos of clean kapok per year. From the seventh to the tenth year a hectare should yield about 640 kilos. The harvesting is troublesome; many let the pods ripen and drop, but this is not good. Owing to the weakness of the branches, especially between their middle bend points, they are practically inaccessible, and the pods can best be gathered by knives attached to long poles.† To know when the pods are ripe requires experience. Before ripening they are of a light green colour, with a smooth surface, whilst as soon as they ripen they turn light brown, and the surface becomes somewhat wrinkled.

AN important by-product of the lime cultivation is lime skins, the *Agricultural News*, of Barbados, tells us. They may be fed to stock, and the surplus may be made into ensilage, thus providing succulent food out of crop time. In Dominica the skins are never applied as a manure direct; this would certainly injure the trees. They must first pass through the pen. This reminds us that, according to Reginald Enoch, hogs in Paraguay are fattened on oranges at times.

WE have had several inquiries as to the percentage of moisture in wattle bark when shipped, and in answer to same reminded our friends that the Imperial Institute reported a moisture content of 10.3 per cent. in Victoria Nyanza bark, valued at £7 10s. per ton c.i.f. London in May, 1913.

* All these details are taken from here and there in Mr. Saleeby's book.

† This reminds one of gathering cacao pods.

Japan and the Dutch East Indies.

By Mr. SADAŌ YAMADA, of the *Gomū Sekai* (*Rubber World*) of Tokyo.

THE total area of the Dutch East Indies (Java, Sumatra, Borneo, Celebes, New Guinea, &c.) is estimated as being 1,750,000 sq. miles, with 40,000,000 inhabitants; of which Java can claim 120,000 sq. miles, and 30,000,000 inhabitants. About three hundred years ago the East India Company came to Hirato, Japan, and conquered Formosa. In 1909 a Japanese consulate was established at Batavia for the first time, and since 1910 a large number of Japanese have been interested in, and carefully studied, the Tropics with their possibilities and profits as agricultural and commercial centres, until the trade figures for 1911, published by the Dutch in Java, show that island to have imported \$1,300,000 (\$=U.S. currency or 4s. 2d.) of Japanese goods, and exported \$6,500,000 to Japan. Where Java has such an advantage over Japan is in the rapidity with which it can gather in its crops after sowing the seed; for instance, pea-nuts (*arachis hypogæa*) in Java yield in a hundred days, maize in forty, cotton in three months, whilst you can gather in two rice crops a year, and take off your first picking of tea two years after planting, and go on picking almost continuously as long as the plant lasts. For these reasons the agriculturist in Java can look to receiving double the income from his land that his Japanese *confrère* can hope for, causing life to be more easily sustained in the Dutch island and leaving its people with a larger surplus to buy goods with, including those imported from Japan by Chinese merchants who know the language and methods of business on both sides. Only since the establishment of a Japanese-Java South Sea steamship line in 1912, has there been a tendency for the Japanese to trade direct with the Javanese, and at the time of writing, a start having been made, there are not wanting signs of an important trade being opened up, and even a Japanese bank being established in Java. But the latter is not yet; for all that, it is bound to come.

Meanwhile if Java is attracting the Japs mostly as a trading centre, Sumatra is doing the same as regards agriculture, the chief crops being tobacco and pepper, at least they were so until much of the land was put under rubber, and more seems likely to follow. The Japanese, it is true, have taken kindly to rubber planting, but as those who have done so speak, as a rule, no European language, they are treated by the Dutch as "natives," with the corresponding disadvantages. At the same time I would tell you that the Japanese are more suited for, and would do best at tea-planting, for there are large mountain areas in the south-west district in Sumatra unsuited for any industry but tea, which can be grown at from 800 to 1,500 ft. up, the climate at this elevation resembling that of Japan. Judging from this, and the fact that a tea company in Hawaii divided 40 per cent. between its shareholders, tea-planting in Sumatra should be a profitable undertaking.

Regarding the trade of Sumatra, this works out at about 20 per cent. of the whole trade of the Dutch East Indies, against perhaps 60 per cent. for Java's share, but the trade of Sumatra especially in agricultural produce is bound to increase. This should certainly be the case if the Japanese took up tea planting out there.

In three years' time, or about 1917, this product alone is certain to benefit the Island's trade, whilst in ten to fifteen years hence, with the Japanese distributed throughout the island, and railways laid down to transport the produce, the future of Sumatra is assured. Those who doubt this have only to wait and watch results of the present awakening of the island.

With the other Dutch colonies, as the Celebes, Borneo, New Guinea, &c., these are not civilized or opened up and settled sufficiently to enable one to estimate when they will become "first chop," the collecting and shipping of shells being the chief trade at present. Even these marine industries sadly need organizing and developing, and when this is done they will greatly increase in volume and importance, and if the Japanese, as they could do, become familiar with the fisheries of the Eastern Celebes, they could open up a market in the export of dry fish to Singapore, South China and elsewhere with considerable advantage to themselves. At the end of 1912 it was estimated that there were 3,000 Japanese, men and women, in the Dutch colonies, say 800 in Java, 600 in the Arru Islands, 500 to 600 in Sumatra, and the remaining numbers are spread over Borneo, the Celebes, &c. Again take shops run by the Japanese: there are, I believe, two in Batavia, ten at Samarang, fifteen at Soerabaya, and two or three grocery stores at all the central towns. In Borneo there are four or five in the western part, one in the south, and three or four in the south-east; then there are five or six in Macassar in the Celebes and three in the north-western part, whilst Dobo in the Arru Islands can boast of five if not six shops. Groceries seem to form the major portion and the trading concerns that run these include the Mitsui Co., as at Soerabaya, Java, which includes the export of sugar from Java to Japan; the Shioya Co., at Tokyo in Japan, is interested in exporting groceries from Japan to Java; and the Inagaki Co., Kyoto, Japan, exports groceries to Java and imports lead, &c., in exchange.

The Cost of Making Copra.

MR. L. C. BROWN, Inspector of Coco-nut Plantations, who figured in TROPICAL LIFE for June, 1912, as "Our Friend," was kind enough to send us the following valuable notes: "Your letter to hand and thanks for the copies of TROPICAL LIFE; your query (see June issue, p. 103) regarding what coco-nuts cost per 1,000 to produce appears to me rather vague, as it entirely depends upon what items of expenditure you intend to include. I may mention that in my opinion the only saving you can look for on an estate of 2,000 acres or more, compared with one of 500, lies in the cost per acre for supervision and buildings, for the general expense of felling, draining, maintenance, weeding, picking and the manufacture of copra would practically remain the same. An estate of 5,000 acres, however, might cause the planter to produce sufficient to feed a factory to turn out oil, coir and even to make rope, from which sources additional profits might certainly be looked for. An estate, say of 1,000 acres planted 30 x 30, or 48 to the acre, giving an average of 50 nuts per tree when in full bearing, should yield 48,000 x 50 = 2,400,000 nuts per annum, and I calculate on an average that 1,000 nuts will give 4 piculs 30 katties of copra,

making the entire production amount to 10,320 piculs of copra in the year. Then again the average price of copra has been a good deal over \$10 per picul (133½ lb.) cash price at Singapore or Penang for some time past (it is up to Rs.106 per candy of 560 lb. in Ceylon), but taking \$10 as a reasonable average price ($\$ = 2/4$) the gross revenue for the year would be \$103,200 or \$103.20 per acre. I now enter upon the cost of production, which comes to \$38.79 per acre, made up as follows:—

Quit rent	.. .. .	\$ 2.00
Maintenance and transport	.. .. .	7.75
Picking, curing and maintenance at		
1.50 per picul	.. .. .	16.51
Medical and contingencies	.. .. .	3.00
Superintendence	.. .. .	8.00
Duty 1½ per cent. ad val.	.. .. .	1.53

38.79 per acre

"The above allows for a European manager and assistant, also for a labour force of 180 to 200 coolies, that is to say five to six acres per coolie.

"The capital required to bring such an estate into full bearing, or let us say up to the eighth year, may be taken as \$200,000 or \$200 (£23 6s. 8d.) per acre, to which has to be added the cost of the buildings and factory, say \$60,000 or \$260,000 (£30,333) in all.

"According to these figures, if our calculations are correct we arrive at the following: Deduct \$38.79, cost of production as above, from \$103.20 the gross revenue per acre of forty-eight trees, and you obtain a net profit, annually, of \$64.41 per acre, and therefore \$64,410 (£7,500) on the thousand acres. As coco-nuts are considered to be a sound and lasting investment, this may surely be regarded as an excellent return, even after allowing for the setting aside of a certain amount for deterioration of buildings, for interest on the capital, and to provide for a reserve fund.

"Again, at 2,400 nuts to the acre, and 4³/₁₀ piculs* to the 1,000 nuts, rather over 10 piculs can be calculated as going to the acre. Let us call it 10 piculs to facilitate calculations. On such a basis as we have been discussing, the copra would cost \$3.87 per picul to produce, against \$10.32 gross revenue per picul per annum. At 50 nuts to the tree, four palms would therefore give 200 nuts or about 1 picul of copra, or an average net profit per year of \$6.45 (about 15s.) equal to 3s. 9d. per palm, exclusive of interest, reserve fund, or deterioration.

"As Ceylon has been quoting up to Rs.106 per candy of 560 lb., when a stiff rise had occurred, \$10 or 23s. 4d. a picul of 133½ lb. is near enough for a trustworthy estimate."

PRICES of margarine and soap, we are told, are to be dearer over here on account of the increased price of the raw material. Those having to "house-keep" on incomes of £300 a year or less, even with only two or three children, are certainly having a bad time just now. This reminds us that Sir W. H. Lever, in acknowledging his August number, wrote us: "I have read your leading article on the Tropics, and quite agree with you as to the importance of tropical products in the feeding, nourishment, and health of the inhabitants of temperate countries."

* Picul = 133½ lb.; 100 katties = 1 picul; 16 piculs 80 katties = 1 ton; 3 piculs = 400 lb.; \$ = 2s. 4d.

TEA NOTES.

"TROPICUS," in the August issue of *The Tea and Coffee Trade Journal* of New York, evidently considered the remarks made in the July issue of that journal, relative to the experiments conducted in India with a view of proving the advantages of using dynamite, as tending to discourage the use of explosives, for he writes (see p. 143): "Referring to the nine-line paragraph on p. 50 of your July issue on cultivating tea lands with dynamite, I do not think that your correspondent has seized the main advantages of aerating and breaking up the sub-soil by means of this modern adjunct to agricultural aids. It is to overcome the serious disadvantages of coolie labour, with its lack of physical energy and strength, that the explosives are needed, as the mere scratching over the surface of the soil causes a hard-pan subsoil to form, which is unfavourable if not actually inimical to the success of any estate, be it tea, sugar, paddy or anything else. For these reasons the reports published in the East, both in India and Ceylon, speak well of the results of using dynamite."

Drainage, we are told, has been improved by the breaking up of the hard-pan stratum of the soil, and tea planted on abandoned land after dynamiting is said to be better than on similar land not so treated. The possibilities of deep cultivation offered by the use of explosives has, however, been fully realized, as was shown by the attention given to the paper on "Farming with Dynamite" contributed by the Editor of TROPICAL LIFE to the New York Rubber Conference last year.

Our New York contemporary also publishes some interesting notes on tea planting in Ceylon by Mr. Henry D. Baker, who says in the course of his remarks that although at the height of the rubber boom it appeared as if the tea industry of Ceylon might become subordinate to that of rubber, yet there is now a reaction, especially since the price of rubber tends downwards, and tea returns from 7 to 40 per cent. Generally speaking (in Ceylon) it takes 300 coolies to work 400 acres, or "three-quarters of a coolie per acre"; the men get about 11 cents (American) a day, the women and children 8 cents. The chief food of the coolies on the plantations is rice, which costs them about \$1.50 a month, and coconuts about 45 cents per month. Next to the cost of labour comes that for fertilizers. About one ton of good fertilizer is required for every three acres, or about $\frac{1}{4}$ lb. for each plant. The fertilizers include ground-nut cake, castor-cake, sulphate of potash and muriate of potash. No mention is made of nitrate of soda, and yet if applied at the right time and in small doses this valuable manure causes the trees to put out an excellent flush.

Makers of motor-cars and commercial motors should note that American makers are advised to make an immediate effort to secure a share in the excellent and increasing demand for these useful vehicles, also for pumps and iron buildings, &c., on estates in the East.

The *Ceylon Observer*, on July 22, published some useful data of the cost of dynamiting the soil for planting, and showed that according to experiments carried out, the relative cost of using dynamite compared with coolie labour is in favour of the explosive, averaging, as it did, Rs.10 an acre. That was also what it worked out at on an acre of hard, cabooky ground planted with rubber and tea elsewhere, with 100 holes drilled to the acre, including the preparation of the

charges and firing of same, two coolies being employed to do the work. At a very conservative estimate it is reckoned that two coolies could put down at least 175 holes a day working seven hours a day. That labour at 35 cents each a day would cost 70 cents. Two other coolies with more experience for preparing the charge, charging the hole and firing, at say, 50 cents each day would bring the total cost of four coolies to R.1.70 per day: so that the actual cost would work out at 1 cent (100 cents=R.1 or 1s. 4d.) a hole. Coolie labour could not be compared with the use of dynamite for such agricultural purposes as had been indicated, since coolie labour could only make spade holes of a certain depth and circumference, and there it ended as far as effectiveness was concerned, whilst dynamite broke up the subsoil and hard pan and created a cavity which was both a hole and a reservoir for holding water, at the same time permitting the moisture in the substratum to come through to the roots of the trees during periods of drought, which was in itself a decided advantage.

Holes blasted with dynamite remained open for a considerable period, whereas holes made by coolie labour, once planted over, and packed tight by the filling-in process, resembled the surrounding soil in its hard primeval state. As for the cost against coolie labour, the use of dynamite in the manner advised served to prove that a greater area could be covered by four coolies using dynamite in the quantities recommended, than by treble that number of coolies with ordinary hand labour. In removing or reducing ant heaps, smashing boulders, or blasting tree stumps, dynamite as against coolie labour was absolutely more economical. This had been fully demonstrated on two estates. With dynamite ant heaps were destroyed at a cost of about 15 cents to 25 cents per heap, whilst by the existing methods it would have cost about R.1.50.

At a meeting of the Committee of Agricultural Experiments on July 10 a memorandum by Mr. Corlett on dynamiting experiments carried on at Peradeniya was read by the Chairman, which showed that each hole cost 25 cents (100 cents = 1s. 4d.), and he pointed out that now, as they had seen the experiments, it might be done cheaper.

Many queries have been raised by various members of the Committee regarding the various uses of dynamite and the estimated cost of blasting with Nobel's Dynamite which is as follows:—One case containing 200 cartridges $\frac{7}{8}$ of an inch in diameter, Rs.24, or 12 cents per cartridge; detonators, Rs.19.50 per 1,000, or 2 cents each; fuse about 1 cent per foot, there being 24 feet to a coil; using at the most for a hole two feet—half a cartridge 6 cents, one detonator 2 cents; 2 feet of fuze at 1 cent per foot, 2 cents, 10 cents per hole. Two coolies can put down 25 holes per hour, or 175 holes in a day of 7 hours. Labour cost for each coolie, 35 cents; 70 cents for two coolies; add two other coolies expert in making primers, charging holes and firing same at 50 cents each per day, R.1, bringing the total cost of labour to R.1.70 per day, equal to 1 cent per hole (175 holes); can the cost of coolie-dug holes compare with this? The total cost of dynamite, detonators and fuse and labour is thus 11 cents per hole. All this is in Ceylon. Those making use of explosives at other centres would be well advised to compare these rates with their cost. Should they require

further particulars, we shall be pleased to answer any queries sent to us on the subject.

We are glad to see by Messrs. Wm. Jas. and Hy. Thompson's Weekly Circular that the expectations of a strong market in view of the light offerings this week have been amply justified, the sale passed with a better tone throughout and the keen buying of all classes of tea, which was the significant feature last week, has become more pronounced.

Among Indians some of the invoices have been of a good useful standard, but the general tendency of quality has been slightly on the downward grade and has shown a falling off in the colour of tip, but on the other hand Darjeeling has offered some choice parcels, and dealings have been on a distinctly higher basis of value for practically all grades and qualities. In Ceylon the higher grown teas are showing improvement in quality and buyers quickly noticed the change by offering higher prices, and the auctions followed closely the trend of the Indian market, the moderate quantity being readily absorbed at firm to advancing prices, though in some cases a little irregularity was noticeable.

At the sales during the week ending September 11th there was a good representative selection of Indian teas from every district, including many useful invoices from Assam and some fine Darjeelings. The sale opened with a good general demand from all quarters, fine to finest teas and good liquoring descriptions being keenly competed for, medium kinds from 11d. to 1s. also attracted strong competition, and last week's values were maintained, while all well-made Orange Pekoes and Pekoes with good appearance were freely taken by the export and continental houses. Clean common leaf continues to sell at about 7½d. Darjeelings with true flavour continued to sell freely under an active competition, but where invoices showed a falling off in flavour bidding was less keen and prices showed some irregularity. Southern Indian teas were readily taken at current rates, with an improvement here and there on the invoices from higher districts. The average for the whole sale on Garden Account is 9½d. per lb., against 9d. per lb. a year ago (September, 1912).

Generally, the Ceylon market remained as firm as at the previous auctions, though perhaps competition lacked some of the keenness then in evidence. As regards quality, changes were mainly towards improvement, some invoices being decidedly better than those last offering. Tea for price was again in strong demand and occasionally showed a farthing advance; this applies practically to all leaf teas. Broken Pekoes, though selling well on the whole, here and there showed some irregularity. The average for the whole sale on Garden Account is 9d. per lb., against 8½d. per lb. last year.

CONSIDERABLE interest has been shown lately in Trinidad in regard to agricultural banks. A letter in the *Port of Spain Gazette* (July 19th, 1913) suggests that a probationary or educational period is required for peasants in that island, and advocates the institution of crop-advance warrants for cacao and other produce. Such a system, it is believed, would pave the way for more advanced systems of co-operative banking.

"Coco-nuts—the Consols of the East."

FIRST EDITION EXHAUSTED; A SECOND BEING PREPARED.

Sir William Lever's Striking New "Foreword."

VIRTUE in an editor or a publisher does not, we are learning, always bring its own reward. This has been forcibly brought home to us when issuing invitations to our advertising friends to come into the second edition of our "Coco-nut Book," which is now on the way. Some complain, whilst still coming in, at our dropping on them again so soon for more money. To this we can only answer that our fault, if it exists at all, lies only in the rapid manner we have distributed our advertising matter carrying their notices throughout the world; for whilst an indifferent book may take two, three, or more years to sell out, ours was exhausted in twelve months, and that is a creditable rather than a blameworthy performance. But the hardest hit of all comes from a firm which writes: "We are not able to give an advertisement for the further edition of your book, much as we should like to have done, as for some time to come we are restricting our advertising to enable us to deal with the enormous amount of inquiries we already have in hand." To our advertising department, therefore, the world seems divided into two sections, viz.: (1) those who will not advertise because, not knowing the excellent circulation that our literature controls, they are afraid they will not get full value for their money; (2) those who, like the friends just stated, secure such unlooked-for results from their advertisements, that they are obliged to let you pass by next time owing to their being so busy keeping up with the inquiries and orders that come rushing on, they have no time to notice you, or are afraid that you will further add to their troubles. Certainly it is difficult to know what to do. Meanwhile our warm thanks are due to those who have supported us, even under the present trying conditions, as well as to our oversea friends, who are sending across their orders in such numbers that we have thought it wise to increase the copies to be printed off by another thousand. Sir W. H. Lever has contributed another "Foreword," not without inconvenience to himself, for in answer to our request that he should do so he writes on September 15th: "I am leaving on Saturday (20th), and am afraid I have too little time to write the article. . . . However, if you will let me know what you wish me to do, I will endeavour to meet it, as I am very anxious to help you all I possibly can."

The new "Foreword" will, as one friend immediately put it, make the coco-nut world "sit up." Those who have seen it agree with our estimate that it forms the most important pronouncement on coco-nut finance, the cost of production and future prospects yet published. It is much longer than the one last year, and passes in review, and answers the many critics and criticisms brought into being by its predecessors. The concluding paragraph especially will be noted and quoted by the coco-nut world, and that also to an even greater extent than were the opening words of the first foreword. Here is the opening sentence (of the last paragraph) as a sample of what follows:—

"Strong as was the case for the profitable outlook

of coco-nut planting when I wrote the 'Foreword' to the first edition, it is stronger to-day."

* * * * *

Yours faithfully,

A. A. Leves

The book will be issued with all possible speed. Those who have been disappointed in getting copies of the first edition can, therefore, look to soon be receiving a copy of the second one. Meanwhile the orders are coming in fast enough to cause us to order a further thousand to be added to the number to be printed off, as we do not want to run short a second time.

The Plumage Trade and Bird Protection.

A STEP IN THE RIGHT DIRECTION.

WE are glad to see by the *Journal of the London Chamber of Commerce* that, following a resolution passed by a meeting of the Textile Trade Section of the London Chamber of Commerce in February last, an independent Committee for the Economic Preservation of Birds has been constituted, with the following objects: (1) To unite for practical purposes all those interested in the world's avi-fauna from the scientific, æsthetic and commercial points of view. (2) To obtain reliable evidence from all parts of the world as to the existing conditions of bird-life. (3) To consider and suggest to those interested, the best means to protect, maintain and encourage the increase of all useful species, including those used in the feather trade, so as to ensure a regular supply without endangering any. (4) To consider and advise on the question of domestication of various wild birds for scientific and commercial use. (5) To get into touch with those Government Departments interested in these questions, and try to secure official help in carrying out the above objects. The Textile Trade Section, in July, passed a resolution undertaking to support this Committee and pledging itself to do its utmost to obtain the support of the trade to its findings. The Executive of the Committee has already issued a circular with a comprehensive list of queries to all the Consuls and Vice-Consuls in the Tropics, and has invited special reports from experts upon the condition of certain species; and it is hoped that all interested in birds from whatever point of view will assist the inquiry now in progress. In the meantime, the feather trade have good grounds for their contention that the enactment of any prohibitory legislation, prior to the fullest and most impartial inquiry, would be inequitable and would probably not attain the object of its promoters.

This, so far as we can judge by the printed statements, is a step in the right direction, and we wish the above movement every success, and believe that, with its help, our motto of "Utilization, not Extermination," can be carried into effect, and that whilst the birds are not only preserved, but their numbers increased, important trades will be continued in England to the benefit of a large number of people. Hitherto those in favour of continuing the trade, sub-

ject, of course, to care being taken to prevent extermination, have seemed unable to realize that the only way to counteract the influence of the detractors of the trade was to educate the public up to the true state of affairs by means of the press. Steps, we believe, are being taken to do something of the sort, and the sooner that the Economic Bird Committee get to work, both personally and in print, the better both for the Tropics and for the trade and allied industries over here.

Economic Zoology.

Our Motto: "Utilization, not Extermination."

Conducted by FRANK FINN, B.A., Hon. F.Z.S.

THE TRANSPORTED BIRDS OF PARADISE.

IN the *Field* for July 12th Mr. Collingwood Ingram gives an interesting account of the progress of the experiment being made by his father, Sir William Ingram, in the introduction of the great emerald bird-of-paradise (*Paradisea apoda*) into the West Indies. This species, although a local race of it is found on the New Guinea mainland, is best known from the Aru Islands, and it was thence that the original stock was procured in 1909. These were brought over and turned out on the island of Little Tobago, which Sir William had purchased, to the number of forty-four, and three more were subsequently liberated. All these were young birds without plumes, or hens; it is thought the majority were males.

Sir William Ingram and his son visited the island in January last for the first time; it is about a mile and a half off the main island of Tobago, and is about a mile long, rocky, and well wooded, thus reproducing the conditions of the natural home of the birds. Clearings have been made, by the owner's orders, and bananas and papaws planted to supplement the natural food-supply; water, and that undrinkable by man, is only found in one spot, but the birds appeared to be independent of it, or nearly so. If the dew does not suffice, as it is suggested it may, it may very well be that the birds can exist without it, especially as they feed so largely on fruit. That several native birds exist on the island, and also do not much patronize the only watering-place, points in this direction. Moreover, it may be remarked that it has been recently recorded that on the small Henderson Island, 120 miles north-west of Pitcairn, a fruit-pigeon, a lory, a rail, and a reed-warbler, all peculiar to the island, succeed in existing without any water at all—not even a swamp. Several specimens of the birds-of-paradise were seen on Little Tobago, in one instance four together, but none bearing any plumes as yet; the party of four was believed to consist of two young males and two females. The only adverse influence to the paradise birds noted was the presence of the yellow-tailed cassiques, or corn-birds (*Ostinops decumanus*), a species of troupial, which, though smaller than the paradise birds, would not let them feed on their favourite papaw till they themselves had finished. Blue tanagers were also present and fed greedily on the papaws.

Mr. Ingram considers that the paradise birds are at least maintaining their numbers, though it is doubtful if they have bred as yet, and thinks "there is now

every reason to hope that the colony will continue to thrive in their new West Indian home."

It is to be hoped that he is right; but if I had anything to do with the experiment I should try to make the water-supply a little better, on the off-chance of its being needed, and I should endeavour to exterminate the competing troupials and tanagers, the former especially; they are well known on the mainland, and so it would not be a case of exterminating species, while even if it were, the birds-of-paradise should stand first on all grounds.

That the birds will fly over to the mainland is, I think, very doubtful, for Mr. W. Frost, who got the birds over here from Aru and thence to Little Tobago for Sir William (though he is not mentioned by name in the article), told me he was under the impression that they could not fly a mile. Here, then, we have the beginning of what may prove a very "big thing"; there are hundreds of tropical islands where these birds might be introduced and furnish an important revenue. It is not necessary, although the Papuans do it, to kill even the old plume-bearing cocks; they could be caught alive, clipped, and then released. One bird Mr. Frost brought home was an adult male, of which a too-business-like Papuan had actually plucked the plumes out and sold them to a Chinaman before bringing him the victim. This bird was on view at the Zoo till comparatively lately.

EGRET EXPLOITATION.

Apropos of this, in a recent number of the *Bombay Natural History Society's Journal* it is recorded that at the Manchar Lake, in Sind, egrets are kept for their plumes. According to Captain C. H. Elliot: "Each bird," he says, "I am informed yields about Rs.6 worth of feathers per annum." The native, with characteristic indifference to animal suffering, blinds the birds to keep them from escaping, and it is in connection with other cruelties to birds that the subject is mentioned at all.

But, of course, cruelty of this sort is no more an essential to the keeping of the birds for their feathers than cock-fighting is to poultry-rearing. The point of economic interest is that it pays the natives to feed these poor blinded birds for a whole year to get plumes to the value of six rupees=eight shillings. Obviously, therefore, where fish are plentiful egrets can be kept at a profit, even if all food is given them by hand. But no doubt the fish given them by their owners, who, I believe, are fishermen, would be small, useless fish incidentally captured, or fish-cleanings. I may mention here that the Maoris, who highly value the plumes of the large egret, a rare bird in New Zealand, used to keep the unfortunate birds in small cages, feed them on small fish, and pluck their plumes. This atrocity of keeping blinded birds ought, of course, to be put a stop to, but there is no reason why what savage and half-civilized men have done in a brutal way should not be done humanely by civilized people, i.e., egrets should be kept under decent conditions and clipped yearly, as is done with ostriches.

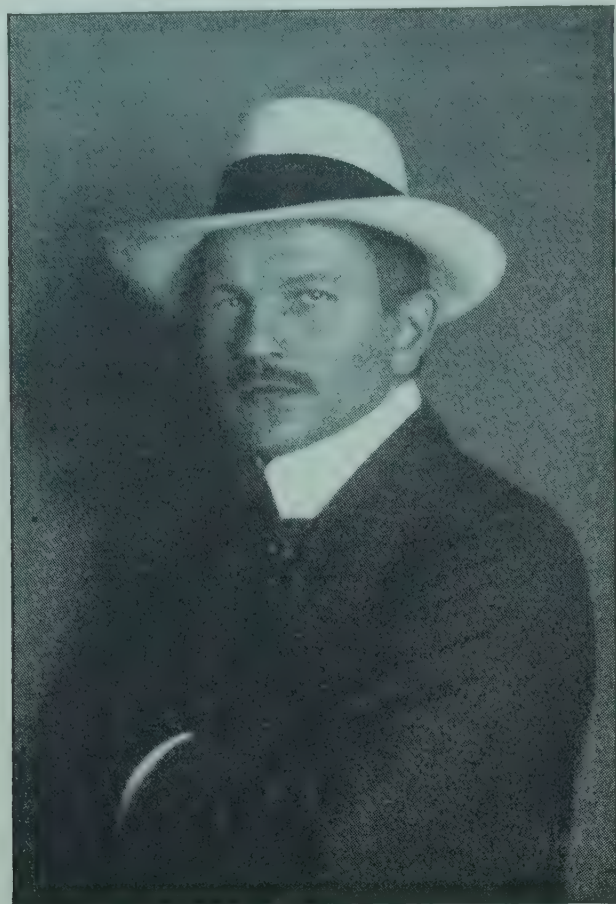
It must be remembered that the plumes of the ostrich used formerly to be obtained in a very brutal and wasteful manner; the bird was either killed at the nest, or ridden down by horsemen posted so as to intercept the creature in the circular course it runs,

until it dropped from exhaustion, a similar fate overtaking a horse or two incidentally. Yet no reasonable person would object to modern ostrich exploitation on account of these primitive and cruel methods.

While on the subject of egrets, an important *Bulletin* (No. 45) has just been issued by the Biological Survey Section of the United States Department of Agriculture, written by Mr. Wells W. Cooke. This deals with the distribution and migrations of North American herons and their allies, including, of course, the local race of the large egret and the small snowy egret. According to this account the great colonies of the large egret are entirely a thing of the past, and the snowy egret has suffered a severer persecution than any other heron, but a few small colonies of it also remain even in the United States. A large colony existed up to 1886 even as far north as New Jersey. In the introduction, however, it is said that "no birds have ever been the recipients of more zealous care than is now accorded to the remaining colonies of the larger and smaller egrets."

One cannot grumble at the restrictive measures taken to preserve species in a country like the United States, where it appears at present almost impossible to preserve any creature which is marketable from wholesale and reckless extermination. Not only egrets have suffered in this way, but game birds and beasts whose representatives are protected and yet utilized regularly in the old countries of Europe. Nor have egrets and game creatures been exterminated by the far older civilization of India; the native, however incidentally cruel, not being a wanton or wholesale devastator as the European so often is. It would seem, then, that any exploitation of the egrets should take place in British territory, where it is possible to enforce respect for reasonable restrictive measures.

That birds which bear plumes admittedly worth their weight in gold, and live largely on fish, which not only form an important item of human food, but are instrumental in keeping down mosquitoes by devouring the larvæ, should not be exploited at all, seems to me ridiculous. The former great numbers of the egrets show that they are dominant and thriving species by nature, and all that is wanted is to put a stop to practices involving cruelty, such as shooting birds feeding young and blinding captives; and to encourage the investigation and destruction of the enemies of egrets. That a bird can be killed in large numbers for human use and yet by human protection and encouragement remain equally numerous is shown in Europe by the status of the guinea-fowl, which, although an introduced and domestic bird, is allowed to live nearly a wild life. Guinea-fowls "come into season" in early spring, hence all those to be seen in the poulterers' shops are potential breeders. Yet there are plenty left to go on with; enough are left to keep up the race. The very instinct of breeding in colonies, and the marked conspicuousness which have been so fatal to egrets in the past, can be made subservient to their protection, as is said to be done in some parts of South America. This is assuming that birds are to be killed for their plumes, but with protected birds and skilled catchers this would not be necessary; but even if it were, shooting a certain proportion of birds before the eggs were hatched would meet all requirements.



“Tropical Life” Friend.—No. 99.

DR. ERNST FICKENDEY.

Director, Experimental Station, Victoria, Cameroons.

As our readers now know, we are indebted to “Our Friend” for an important portion of the book on “The Fermentation of Cacao,” which we have just published. The careful attention that has always been devoted to the cultivation of cacao in the Cameroons has been ably continued under Dr. Fickendey’s control and directions until, on account of the careful and scientific cultivation that the trees have continued to receive, substantial increases in the output have been registered year by year, whilst the quality of the beans has caused them to find a ready market at remunerative prices. In a previous issue we showed how the output of Cameroon cacao had increased in ten years from 648 tons in 1902, to some 4,600 tons last year, an increase that does credit to planters and agricultural department alike.

Dr. Fickendey was born at Uthmöden (Brunswick) in 1878, and eighteen years later, *i.e.*, in 1896, he concluded his studies at the Gymnasium, or High School, of Neuahaldensleben, and for the next three years mainly devoted his energies to mastering practical agriculture under up-to-date methods. Whilst doing so, as well as later on, he was, from 1898-1904, studying natural science at the universities of Berlin and Leipzig, finally emerging from Leipzig with the degree of Doctor of Chemistry, Physics and Botany. As an assistant at the Landwirtschaftlichen or Agricultural Institute at Königsberg, “Our Friend” turned his attention to studying the condition and ingredients of the soil, and published several articles on the results of his investigations. In 1908 he entered the Colonial service, and was attached to the “Versuchsanstalt

für Landeskultur,” or Experimental Station, at Victoria, in the Cameroons. In 1912 he was appointed director of the establishment, and it was then that he first took up the study of the “Fermentation of Cacao,” and having completed a thorough investigation into this matter, he turned his attention to the question of tapping rubber trees and the preparation of the latex. As a result, his writings on the nature of *Kickxia*, or *Funtumia elastica*, &c., in *Der Tropenpflanzer* are well known, and have been much appreciated. These include articles published in that journal in 1909, as well as others on Rubber Coagulation (*Kolloid-Zeitschrift*), on Palm-oil as an Edible Product in 1910, and on Wound Response in 1911, together with his report on the tackiness of rubber.

When “The Fermentation of Cacao” was published Dr. Fickendey was spending a well-earned rest at his German home, where, in answer to our queries as to the importance of the Tropics and tropical produce to Modern Europe, on account of the tendency of the factory to drive agriculture and farmers overseas,* he was good enough to write as follows:—

“I am glad to say that I entirely agree with your views on the growing dependency of England and the Continental States of Europe on Colonial, especially tropical, produce. The idea of establishing agricultural colleges in the Tropics and of increasing the supplies of raw material and food by a thoroughly scientific as well as a practical training of those who want to become planters in the Tropics is therefore quite obvious to me, as to anyone who really knows the Tropics and wants to develop their possibilities. Of course, only such regions would be fit for establishing these colleges where a certain degree of civilization has already been reached, where there is no want of native population to supply the necessary labour, and where the sanitary conditions allow white men to stay a sufficient time without too great harm to their health. Ceylon in the East, and Trinidad in the West Indies certainly offer all these requirements.”

Dr. Fickendey always bears eloquent testimony to the good work that tropical medicine is doing on all sides throughout the Tropics, for without its valuable aid the natives could not live so easily under “white” conditions, whilst the “whites” without the natives could not possibly undertake to open up and develop the Tropics, as they propose to do and are doing. We quite agree with “Our Friend” on this matter.

WE understand that both Brazil and Venezuela are paying more attention to their coco-nut industries. The Brazilian Minister of Agriculture is most anxious to encourage the systematic cultivation of coco-nut palms and the exportation of copra, and even proposes to grant bounties to stimulate the industry. Other inducements may include the admission of all the necessary machinery duty free, and a premium up to a maximum amount of £2,000 per annum on the copra and coco-nut oil exported. In Venezuela a company is being formed at Cumana for the exploitation of copra and coco-nut oil, as the palm abounds in the neighbouring districts.

* As discussed in our July leading article, p. 131.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

SEPTEMBER, 1913.

The Trek to the Tropics and Agricultural Colleges.

UNDER the title of "Industrial Centres and the Supply of Tropical Produce," we were glad to see that the *Agricultural News* of Barbados, W.I., for August 16th, discusses our leading article, "The Trek to the Tropics," published in TROPICAL LIFE for July.

Those who, like ourselves, feel the need of consolidating and assuring our supplies of raw material and food-stuffs will be glad to know that Ceylon seems likely to secure an Agricultural College, to train up managers and scientific research men for the (perhaps) £200,000,000 or more of rubber, tea, rice, wheat, sugar, and other agricultural industries in the East run more or less under European company guidance and with their financial assistance! In a word, agricultural enterprise in the East is largely company-controlled, in marked contrast to the West Indies, where the estates are nearly all in private hands, and the owners for the most part either dwell in the Tropics or manage the estates personally from here. Whilst, therefore, it is entirely to the advantage of the Eastern Boards of Directors to attract to the Tropics young men to manage their properties, and to train them *in situ*, i.e., in an agricultural college set up in their midst, no one can pretend that it is in any way to the interest of the West India cacao or rubber planter to do so. We say this because these newcomers would, in 90 per cent. of the cases (where they are steady and ambitious, and no one wants them if they are otherwise), start planting on their own account and so set up in competition against the already established West Indian planters, who, as it is, are finding the Gold Coast, Brazilian and other producers

extremely troublesome rivals when it comes to selling their produce to the manufacturers in Europe and America.

It is only right and fair, therefore, that the cost of the Agricultural College to be set up in the East should, at least in part, be defrayed by subscriptions from the estate-owning companies, who can only stand to benefit by the inflow of just the class of trained men—scientific and practical—they need and without whose help they cannot prosper.

In the West, however badly our Empire needs their assistance, these future planters are neither needed nor (for the sake of arguments) are they wanted by the established planters. To expect West Indian estate owners as a class, therefore, to put their hands deeply into their pockets for the sole purpose of increasing the number of their competitors is, to put it mildly, unreasonable. Like the "Impossible Uncle" in "Lady Noggs—Peeress," it is enough to make the planter speak his mind in sibilant Spanish; but, then, there is no need to disturb them in this way. *The Trade and Commerce of the United Kingdom*, whether it knows it or not, is sadly in need of, and sooner or later must have, an Agricultural College in the West Indies at which to train men to take up planting not only in the West Indies—where, in fact (we hope), only 10 per cent. of them will stop—but to enable them to go across to, and spread themselves out over, the rich lands of Latin America, and do for English manufacturers and private households what their fellow-planters are doing in India and the East, *viz.*, to produce and divert to our ports and factories the increased supplies of raw material and food-stuffs that we sadly need, instead of letting them go elsewhere. If the Imperial Government cannot realize the necessity of this, and do not feel the impossibility of expecting the West India planter, like the Eastern company director, to find the money to establish the College to start these fresh channels of trade, then we fear, with every apology for saying so, that those who are members of the Government do not realize the position in which this country is placed, and what the absence of such a College will mean to coming generations.

Those in the East, realizing their needs and the benefits it will bring them directly, have agreed, in theory, to erect a college in the East, but it is the Imperial Government, as representatives of the British public, not the planter, who need the Agricultural College in the West Indies, and therefore it is the Imperial Government that should pay for it. If Trinidad, or another island, in return for local advantages,* offers the land free on which to erect the buildings and lay out the experimental grounds, it is all that the public can expect, and more than some of them deserve on account of their indifference to the future; but to expect the West Indies to find the money as well as the land is beyond the limits of reason.

* When the College is established in Trinidad, and even before, we would suggest that the £600 scholarships given each year to enable the winners to come over to England to train as doctors and lawyers only should be extended to the profession of agricultural experts. There are, as it is, too many lawyers and plenty of doctors, but far from sufficient well-trained agriculturists, and it is therefore a pity not to include agriculture, and perhaps engineering as well.

Meanwhile the following letter from an ex-M.P. who figures prominently in West Indian matters is worth noting. It bears out what we spoke of last month *re* the present Government and the British Cotton-Growing Association. "About the Tropical College, if the Soudan, Uganda, Nigeria, or any other part of the tropical Empire can get immense *loans* from the British Government for cotton, railways, or claims, why should not the West Indian Colonies write to ask for a small loan for the College? £50,000 would do us, surely, and the islands might defray interest and sinking fund among them. These might be fixed very low, as the Mother Country's contribution, for she will also benefit greatly."

We wonder why the word "*loans*" was underlined, and so appears now in italics as above.

Fish-food and Sea-fishing Industries in the Tropics.

"EAT plenty of fish," we have always been told, "as its phosphorous content acts as a tonic and invigorates the brain." This being so, why do the Tropics persist in neglecting their fishing industries, regardless of the money to be made from them if well organized, and also of the benefit to the health of the residents by including a larger amount of fresh fish in their diet. To-day, by means of Frigorificus or other systems of cool or cold air railway cars, the fish can surely be sent several hundred miles inland, as in South America and elsewhere, for sale and still keep good. Could they not even be transported, as in England, in tanks containing the sea-water? Surely there is no fear of the water becoming stagnant, if kept moving and not delayed on the journey. That, however, we leave to local railways to decide, and will content ourselves by merely calling attention to the benefits and profits to be made out of a well-organized sea-fishing industry conducted with up-to-date appliances. In face of this it is well to remember that some time ago the London *Times* called attention to the new processes for treating and preserving fish, which had been tested in London and Hull. Professor A. J. Danilevsky, a member of the Russian Imperial Academy, claims to have discovered a substance which can be added to water, so that when fish are put into the liquid they remain alive for several hours. The new ingredient is gradually absorbed through the gills and the mouth, and thus enters into the intestines, whereupon it undergoes an organic change and completely disappears. By the use of another liquid the fish can be kept fresh for weeks or months, retaining their normal characteristics both externally and internally. The Professor visited Hull and addressing the Hull Trawlers Owners' Association, undertook to prove that by his process fish could be preserved for an almost indefinite period and placed on the market in a fresh state. Fish were treated in the solutions, sealed by the Russian Vice-Consul and taken charge of by the trawler owners. Sixteen days later the seals were broken and the condition of the fish was admitted to be such as to justify the claims put forward by the Professor.

In our issue of September, 1911, p. 181, we spoke of the splendid possibilities for money-making

offered by the fisheries off Brazil, and also touched on India and her fishing, whilst on pp. 174-175 we reproduced an article from the *Times* on Whaling centres throughout the world, some of them within the tropical zone, including our own West Indian Islands, Brazil, and elsewhere. In November, 1911, we discussed the Indian fisheries and the utilization of surplus fish and fish offal for making guano at some length, and the matter has again cropped up in connection with the East.

"Considering the steady increase in the population of the Federated Malay States and the almost stationary position of the fishing industry," the *Malay Mail* of June 5th tells us, "we think that the time has quite arrived for some practical steps to be taken by Government to stimulate the output of the fisheries. Though tropical waters do not abound in that great profusion of choice fish-foods which the colder waters of the temperate regions can boast of, still there is a great wealth of good edible fish in the seas which wash the Malay Peninsula, which at present seems hardly to be exploited at all. The consequence is that the trade in imported fish is growing steadily year by year. In Perak, for instance, the importation of fish from other countries amounted last year to \$593,339, against \$490,906 in 1911, and \$339,221 in 1910. Then in Selangor, where a prosperous fishing year is reported, the amount of imported fish came to the significant figure of \$510,000. Now a good deal of this fish might surely have been caught in our own waters. Cannot something then be done to further encourage the fishermen, something which will induce them to increase their catches and make the industry a better economic factor in that very vital matter, the food-supply of the Peninsula? By helping the men to get better gear, to use a more serviceable class of boat, by the adoption of wiser methods of storing, transporting and marketing the fish, the authorities surely could render very substantial aid. In view of the steady rise in the price of fresh fish, due to the ever-increasing demand, something also should be done in the interests of the taxpayers, already so hardly pressed by the continuous rise in the cost of living in the F.M.S., to develop the fisheries off the coast."

India, Brazil, the West Indies, and now Malaya, since we hear the same complaints from all sides, surely it is time that enterprise at home awoke and did something to make money, and at the same time give the Tropics more fresh fish.

"THE HEART OF CHINA," by Oliver Bainbridge (*The African Times and Orient Review*. Yellow Cover Series. 158, Fleet Street, London, E.C. 103 pp., many illustrations. Price 2s. 6d. net), has been published to give the author's views of China from within, and to show the error of offering an opinion of the Chinese and their ways by those who may have lived in the country, but have not mixed freely with the people and learnt their ways and tastes. From our experience of the Chinese, most people can and do live for fifty years in their midst and learn nothing really about them, so that when the favoured few, who form the exception to the rule, have anything to say on the subject their remarks are worth noting, and for that reason Mr. Bainbridge's book should attract buyers.

Coco-nuts: their Yield and Value per Palm.

AN important producing centre that would be well advised to study dry-farming methods with a view of adopting them during periods of drought is the Philippine Islands. Had the planters there done so during 1912 we should probably not have heard that, on a conservative estimate, the Zamboanga output of copra was 33 per cent. less than the average. This is a serious loss, and any expense the producers might have been put to during 1912 to prevent this reduction would have been returned to them many times over when the crop came to be realized. If this was the case with Zamboanga, what must it have been elsewhere in the Philippines? For we learn from the *Mindanao Herald* that "the drought which prevailed throughout the entire Philippine Archipelago during 1912 did less damage in Zamboanga than in any other part of the islands, or at least the lack of rain was less noticeable upon the coco-nut trees in that centre than on other produce, such as corn, sugar-cane, rice, tobacco and other crops of the northern islands, but the result of the drought was more noticeable on the coco-nuts three months later.

"On the other hand, the abundance of rain during this year promises to ensure a larger copra production than Zamboanga has ever seen, which, coupled with the high price, will enable the land owners to pay their obligations, and do more planting of coco-nuts, especially by the natives."

This last paragraph not only confirms what we claim about the planters being well able to afford any little extra expense incurred by the adoption of "dry-farming" methods, but also shows, in face of the 1912 drought, how wise it is to regulate and conserve the water when it comes, lest, later on, it tends again to become scarce. On a coco-nut, as well as on most other estates, one can pretty well always drain water off; certainly one can depend with greater certainty on getting rid of water when it is not wanted than on securing supplies (from above) when it is needed. Planters at all centres, such as the Philippines, West Indies, Bahia, &c., which suffered from lack of moisture last year or during the past six months, should in future hold back the rain-water when it does come, and drain it away only if the wet weather continues and threatens to temporarily give them more than the land and crops can absorb. The coco-nut especially responds quickly to irrigation and full water supply. The *Mindanao Herald* also has a word to say on this, as well as on the benefit of seed selection when planting out, since some nuts produce palms that yield so much more freely than others.* Says our contemporary:—

"We would like to suggest that all encouragement and assistance be given the native in the selection of proper seeds, for it is a well-known fact that certain kinds of trees will produce three times as much copra as others under exactly the same conditions, but very few of the natives and Chinese realize that the difference is caused by the kind of seeds planted. Then the old question of irrigation. No matter how good the average rainfall, irrigation should be encouraged.

No plant appreciates cultivation and irrigation more than the coco-nut, and none will pay the owner a better return for labour and attention properly given. It is true that a great number of coco-nut trees have been planted in the district of Zamboanga since the American occupation, and the planting for the most part has been along improved lines, that is, the trees are now being planted 30 ft. apart, which is very important in order to obtain the maximum yield, but no provisions have as yet been made for irrigating, and the constant and continuous cultivation of the land has been most sadly neglected. There are thousands of acres of land in the municipality of Zamboanga ideally adapted to the growing of coco-nuts, and in our opinion the Government should give all possible assistance to those wishing to plant this crop, for the reason that every bearing coco-nut tree in the municipality of Zamboanga at the present is worth at least four pesos per year, and therefore is four pesos per year added to the wealth of the municipality."

Review.

PLANTATION WHITE SUGAR MANUFACTURE. By Harloff and Schmidt, of Java, translated from the second revised Dutch edition by James P. Ogilvie, F.C.S. 135 pp. Price 7s. 6d. net. Norman Rodger, 2, St. Dunstan's Hill, London, E.C.

If ever, or shall we say whenever, a history of the sugar production industries comes to be written, a section would certainly have to be given up to the literature published on the subject, and in that portion of the work whilst Geerlig, Deerr and others would deservedly stand out prominently as authorities and authors of leading works on the subject, the name of Norman Rodger would certainly have to be "writ large" across the top of the page dealing with publishers, not only on account of the books that this enterprising firm has issued on sugar and sugar-making, but also, and even more so, because of the keen personal interest the head of the firm has always taken in the subject, which he has made one so thoroughly his own.*

The book under review, following as it does in the wake of Geerlig's trio of "Cane Sugar and its Manufacture,"† "The World's Cane Sugar Industry,"‡ "Methods of Chemical Control in Cane Sugar Factories,"§ and Deerr's "Cane Sugar,"|| cannot fail to further stimulate the important industry with which it treats, and since these five books between them aggregate some 1,600 pages of closely but clearly printed matter, without any needless wording, the wealth of information they contain is all but exhaustless, and were it not for fresh discoveries and further improvements that are reported almost monthly and need to be recorded and discussed, one could well claim that we have in the above books all worth troubling about as regards the production of sugar. Of the joint authors, Mr. W. H. Harloff is manager of the Boedoeran Sugar Factory, Java, and Mr. H. Schmidt a consulting chemist and engineer

* We have heard that Malaya alone claims to have some twenty varieties of palms, and Samoa and the Philippines each have a goodly number of kinds.

* See "Our Friend" in TROPICAL LIFE for November, 1910, p. 214.
† 352 pp. 13s. post free. ‡ 400 pp. 13s. 6d. post free.
§ 86 pp. 4s. post free. || 592 pp. 21s. 6d. post free.

in the same island, whilst Mr. Ogilvie, to whom we owe the translation, as the technical editor of *The International Sugar Journal*, needs no introduction to our readers. As to the work, some of our readers may recognize in it the original Dutch book "Hand-leiding Voor Tropische Witsuikfabrikatie," which met with so cordial a reception in Java that two editions were speedily exhausted, and a third will shortly be issued. An English edition of such a work, therefore, cannot fail to be welcomed on this side and in English-speaking producing centres overseas. The book is split up into two divisions and sub-sections as under:—

Division A.—The Chemistry of White Sugar Manufacture.

Section 1.—Influence of Alkalies and Alkaline Earths on the constituents of Cane Juice.

Section 2.—Influence of Acids on the constituents of the Sugar Cane.

Section 3.—Influence of Heating on the constituents of Cane Juice.

Section 4.—Colouring Substances of the Cane and those produced during the process of manufacture. (a) Vegetable; (b) Chemical Colouring Matter.

Section 5.—The Different Fermentations that may occur in the Sugar Factory.

Division B.—The Manufacture of White Sugar.

Section 1.—Carbonic Acid Saturation (Carbonation).

Section 2.—The Acid Thin-juice Process.

Section 3.—Raw Juice Sulphitation or Sulphurous Acid Saturation.

Section 4.—Treatment of Thick Juice.

Section 5.—Centrifugal Syrup Treatment.

Section 6.—Curing.

Those who want further information will be wise to secure a copy of this useful work without loss of time. Supplied in a handy double carton cover, it can travel far without hurt.

The International Dry-farming Congress at Tulsa, Okla., U.S.A.

THE EDITOR OF "TROPICAL LIFE" SENDS IN A PAPER.

As already reported, the eighth International Dry-farming Congress will be held in Tulsa, Oklahoma, U.S.A., from October 29th to November 1st. At the same time and place will be held the sixth International Exposition of Soil Products, and the third International Congress of Farm Women.

The seventh Dry-farming Congress was held at Lethbridge, Canada, the sixth (in 1911) at Colorado Springs, Colorado, U.S.A. These meetings are worthy of careful attention on the part of those planting in the Tropics, especially in the dry-zone areas of Ceylon, Brazil, &c.; but even planters in centres which usually have plenty of rain can still learn much *re* mulching, deep-rooting, wind-breaks, &c., as the congresses have for their definite purpose the spread of knowledge as to the best cultural methods in regions of light and irregular rainfalls. As the Tropics generally, during the past two years, have suffered considerably, and

some centres quite seriously, from the effects of irregular rainfalls causing lengthy and unexpected droughts to occur, with loss of trees, and reduced crops of inferior quality, the Editor of *TROPICAL LIFE* has contributed a paper to the Tulsa Congress on "Dry-farming and the Conservation of Moisture in the Tropics." He is doing so in the hopes that in future congresses the Tropics will be better represented than they have been in the past, if not by delegates, at least by papers sent in to be read, and later on included in the report of the proceedings.

The Tulsa Congress will discuss soils, tillage, farm machinery, crops and breeding, agricultural forestry (a most important item, but one that is generally ignored by planters), agricultural engineering, scientific research, &c. Tulsa is spending \$200,000 (over £40,000) on the Congress building and exhibition, and reckons to entertain some 200,000 visitors during the session. Mr. John T. Burns, Tulsa, Oklahoma, U.S.A., is the Executive Secretary. We wish the Congress and its organizers every success.

Hospital Accommodation in the West Indies.

THE *London Daily News* is on the warpath over the following matter, which may certainly require to be looked into, but Royal Commissions are costly and slow. Could not the time and money such an inquiry would incur be utilized to greater advantage in a more immediate remedy for any trouble that may exist? We say this because, so far as we know, such matters in the West Indies can stand comparison, taking into consideration the people needing treatment and the conditions under which they live, with London, where at times, judging by complaints one hears, everything is not altogether perfect; but then, where do we meet perfection? The numbers given below show one bed (roughly) to the thousand inhabitants; has London, where danger to life and limb is a hundred times worse than in Jamaica or the West Indies, got 4,521 beds for its (1911) census of 4,521,301 souls, and even if there are so many, is this number as adequate, considering the conditions among which the Londoner is compelled to live compared to the Jamaican, as the number of beds in Jamaica, Trinidad, or Barbados? This is what the *Daily News* says:—

In 1910 there were in Jamaica exactly 806 hospital beds for a population of little less than 850,000. In 1911 the number had risen to 1,176, but many of these were confined to the use of the indentured coolies of a few estates, though the ratepaying creole has to pay for them. It is now stated that the medical vote, in consequence of the shortness of funds caused by recent large expenditure on public buildings and railways, has been reduced by £5,000. In view of the great amount of sickness in Jamaica and the deplorable poverty of the mass of its inhabitants, the state of things here revealed seems at least to justify the demand for a full inquiry by Royal Commission or otherwise. It is not necessary to assume that anybody is particularly to blame; but it is necessary that our Colonial administration should be free from any possible reproach.

The Motor Plough and its Future.

By F. B. KINGDON, B.A.

THAT motors will eventually be used for work on the land to a very much larger extent than at present goes without saying. The enormous increase in the number employed in Canada alone is evidence of this. Ten years ago those who had the confidence to purchase one lost their money and the machine went to the scrapheap. This doubtless threw back the more general use of them for some years, but the experience gained by manufacturers has enabled them to turn out a really practical machine.

The writer was for many years engaged in the manufacture of these motors, and therefore realizes the difficulties met with and overcome. The first few years were a succession of disappointments—heart-breaking at times—as one part after another, and sometimes the whole design, had to be altered and strengthened, cast iron giving place to steel. But each new machine was an advance on the preceding as experience was gained, until at last a machine was turned out which stood every test.

In all machinery one of the first considerations of the purchaser should be what number of working parts are liable to wear, tear and breakage; the more simple the machine and the fewer the working parts, the less trouble and expense the machine is likely to prove to its owner. In a machine like the one under consideration the number of parts must be large, and in all cases a fair supply of spares should be bought with the machine.

It must be borne in mind that a tractor requires a good portion of the power of the engine to propel itself, therefore the engine should be sufficiently powerful to provide for this in the worst cases and to leave a large enough margin of power for the hardest of the work it has to do; in addition there should be a reserve of power, as no engine should be driven at the limit of its power. Many people, whom we have come across, have the idea that a plough which requires three or four horses to haul it will require a tractor of three or four engine brake-horse-power. To enable the engine to exert its full power on the plough, wheels of sufficient width and diameter must be fitted. This accomplishes another effect: with a broad tyre, the weight of the tractor itself is spread over so many square inches of land that the actual pressure per square inch is very small and less than that of a horse, so that the injury done to the soil—a very frequent argument against tractors—is done away with altogether. Again, with a large diameter tyre very much more of the wheel is in contact with the soil all the time, increasing the grip on the land and decreasing the pressure on each square inch. A wheel carefully designed with reference to the weight of the tractor and the power of the engine very much increases, therefore, the efficiency of the machine and enables it to be used on the land at all times when a horse can be used, that is, whenever it is fit for ploughing; in fact, such a machine can be used when the land is actually under water.

Gearing.—If the tractor is to be used for work on the land only, two speeds are sufficient: one for work on the level and light soils, and the other for work on gradients and heavier soils. If, however, it is to be

used for transport on roads also, it should have a third and higher speed.

Tyres.—These would naturally be of wrought iron or steel, and put on in such a manner that they may be easily renewed; the steering wheel, also, should have a narrow strip on the tread to prevent the machine from slipping towards the furrow.

Ignition.—Both high-tension coil and accumulator should be fitted (or dry batteries) also a reliable magneto, and they should be thoroughly protected from the weather.

Particular attention should be given to the protection afforded to all gearing and bearings, this should effectually preserve them from dust and grit; working on the land these machines are more liable to wear and tear from this cause than perhaps from any other. All bearings should be as long as possible, and lubrication everywhere effectively carried out and automatic.

For the colonist in most cases a tractor which can be used for all kinds of work on the land, transport on roads or veldt, and driving the stationary machines is the most useful, and the power of the engine must be sufficient for the hardest work—ploughing. In driving machinery the whole power of the engine can be used, and will probably be sufficient for driving any machine the owner has. If for transport the tractor should be mounted on a three-point suspension, that is, the axle of the two steering wheels is hinged centrally to the tractor frame, so that in passing over obstructions, and especially where roads are bad or non-existent, the frame is not subjected to undue strains.

The engine power finally settled on must be decided, therefore, in most cases by the plough to be hauled, that is, the number of furrows, their depth, and the kind of soil. For instance, to haul a three-furrow plough 6 to 8 in. deep in a good loamy soil and on fairly level land, an engine of about 20 b.h.p. is necessary. In some countries where the soil is virgin and only ploughed to a depth of 4 in. this tractor should haul a six-furrow plough with ease; on the road it would haul a load of 6 to 7 tons at six miles an hour; it should also haul a large self-binder and two or three mowers by means of suitable attachments.

Cost of Working.—This naturally varies very much according to conditions. In England the cost of ploughing with horses or steam varies from 8s. to 15s. an acre, or even more, and in addition there is the cost of drawing the coal and water. Under favourable conditions the ploughing can be done at as low a figure as 3s. an acre by an oil tractor.

Where oil can be obtained cheaply these tractors offer great advantages over steam, as they may be started instantly without waste of time or fuel, and there is no waste of fuel when the engine is stopped for a short time; they are lighter in general than steam, and narrower, so that they will pass between rows of plants; and lastly, they are much cheaper, the prices ranging from £120 to £500 in England.

Want of space compels me to curtail my remarks, but those who have read such articles as "Steam Ploughing Trials" in *Indian Industries and Power*, pp. 487-489, and "Motor Cultivation" in the *Agricultural News* of Barbados, will realize the prominence that the motor plough has already attained in tropical agriculture.

Cotton.

THE following were the prices for Cotton in London on Sept. 11th, according to Messrs. Slann and Davies :—

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* Liverpool quotations.

Fluctuations in America have been wide and feverish, energized by a recrudescence of the proposed tax upon future contracts and various reports as to its progress and time of enforcement, also as to rains in the South West. Our market, however, has been very cautious in following these gyrations, and the daily Spot demand can only be called "fair." The week shows a rise of 3 $\frac{1}{2}$ to 2 $\frac{1}{2}$ points. East Indian is firm, and prices asked check business. Silver 27 $\frac{3}{4}$ d. per oz.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight	—	—	—	bales
Exports from United States since September 1st—				
To Great Britain	38,000	34,000	48,000	—
To Continent, &c.	61,000	35,000	59,000	—
Total crop	—	—	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	September 11th. d.	Same time 1912. d.	Same time 1911. d.	
September	7·13 $\frac{1}{2}$	6·45	6·65	per lb.
Sept.—Oct.	7·01	6·29	6·18	—
Oct.—Nov.	6·96	6·25 $\frac{1}{2}$	6·11	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

THE fair supplies of all descriptions offered at auction this week (ending September 13th) were in some request, good qualities being in demand at full prices, whilst the lower grades were rather a dragging market. "Futures" have been quiet and easier, and the latest prices show a decline of 1s. 3d. for the week. We quote :—

	To-day	Sept. 4th, 1913
London	Santos, Mar. del. ... 41s. 9d.	... 43s. 0d.
New York	No. 7 Rio ,, ... 9.00 cents	... 9.33 cents
Hamburg	Santos ,, ... 47 $\frac{3}{4}$ pf.	... 48 $\frac{3}{4}$ pf.
Havre	Santos ,, ... 58 $\frac{3}{4}$ francs	... 60 $\frac{1}{4}$ francs

The receipts at Rio and Santos from July 1st to September 10th, 1913, were 3,855,000 bags, against 2,901,000 bags and 3,416,000 bags in the two previous years respectively.

Sales include the following, viz. :—

East India.—Mysore, 67s. to 68s. 6d. for smalls, 74s. to 75s. for middling, 78s. 6d. to 80s. 6d. for bold. Neilgherry, 65s. 6d. for smalls.

Java.—Cherry pickings at 47s. 6d. for smalls, 53s. for medium, 55s. for bold.

Nairobi, &c.—At 67s. for middling.

Costa Rica.—At 69s. for smalls, 63s. 6d. to 69s. for fine ordinary to low middling, 75s. to 80s. for good middling, 78s. to 87s. for fair to fine bold.

Guatemala.—At 54s. 6d. for smalls, 55s. to 59s. 6d. for ordinary to good ordinary, 63s. to 72s. 6d. for fine ordinary to good middling, 75s. to 79s. 6d. for bold.

Salvador.—At 75s. 6d. to 77s. for boldish.

Nicaragua.—At 67s. 6d. for middling, 80s. for bold.

Vera Paz.—At 69s. 6d. to 75s. 6d. for fair to good middling, 77s. 6d. to 80s. 6d. for bold, 91s. for Maragogipe.

Mexican.—At 71s. for good middling, 80s. 6d. for bold.

Colombian.—At 61s. 6d. to 73s. for fine ordinary to good middling, 70s. 6d. to 84s. for fair to fine bold.

Dumont Santos.—Washed at 57s. for smalls, 62s. to 63s. 6d. for medium. Unwashed at 60s. 6d. for medium, 66s. for bold.

Sugar.

WE again had hardly any fluctuations this week, reported Mr. C. Czarnikow on September 11th, notwithstanding favourable weather reports from abroad, and very satisfactory progress in weight of roots. The Eastern crop estimates at present are:—

	1913. Tons.		1912. Tons.		1911. Tons.
Queensland	210,000	...	113,000	...	173,000
New South Wales	20,000	...	16,700	...	17,000
Fiji Islands	86,000	...	60,000	...	75,000

so that, instead of importing heavily, there may be a few cargoes available for export. Formosa, with normal weather, should produce 175,000, against 117,000 and 173,000 and 267,000 tons, therefore Javas may not find a sufficient outlet in the East next August-September. But for the present crop the deliveries in the East seem to absorb the total Java production; the crop evidently has suffered from drought more than expected, and instead of an increase there may be a slight deficit, whilst India has bought more than ever before, yet has to import Mediterranean Beet Crystals, in which a good business has been done already. Crops in India are good, which always increases the buying power. Rains there during February facilitated planting, in June with favourable rains the canes were doing unusually well, but July rains were inadequate. With normal weather in August-September a full normal crop was expected. In Cuba Mr. Himely reports, on August 25th, that want of rain during the previous week kept the canes rather small, but they were still green, and favourable weather (there were rains reported since) might perhaps produce the same crop as last season, but not more.

In America the Senate has now passed the Tariff Bill abolishing the colour test from March 1st next, and reducing the duty on 96 per cent. foreign sugar from 1·685 (0·035 per degree) to 1·256 (0·026 per degree), and on Cuban sugar from 1·348 (0·028 per degree) to 1·0048 (0·0208 per degree) until May 1st, 1916, when all sugar duties are to come to an end. This vote apparently must be ratified by Congress, which may alter the dates, but not the rates. As it renders the production of privileged sugars more onerous, the Bill may ultimately influence the world's sugar prices, but during next October-February privileged sugars will be offering more eagerly, and allow Cubans to be shipped to this side, unless holders can afford to wait for the increased demand after March 1st. Foreign White Sugars will in future pay 1·36 instead of 1·90, and White Cubans 1·088 instead of 1·52, which may somewhat alter the character of supplies in the future.

The American market is a little easier, and 96 per cent. Centrifugals are quoted 3·76 cents = 11s. 1½d. c.i.f. New York for Cubas or 8s. 7½d. f.o.b. Hamburg for 88 per cent. net Beet. In Cuba, we are told, there are three factories at work, against one last year. In the United Kingdom business in refining grades of cane sugar has been unimportant. Grocery crystallized has been slow of sale at previous rates. As regards cane-producing countries, we refer above to the prospects in Australia and elsewhere.

Business done includes a few fine St. Kitts crystal-

lized, which sold at 15s. 6d. duty paid, and some low yellow Trinidads at 14s. 3d., but as regards British West Indian generally, the transactions have been quite insignificant, and of the small quantities offered at auction hardly anything was sold. Meanwhile no business is reported from Liverpool.

Coco-nut Products, &c.

SEPTEMBER opened, according to Messrs. Mordaunt Bros., with Coco-nut Oil still being held at a very high figure, but with a few re-sales at 52s. 9d. for Cochin, and 48s. (per cwt.) for Ceylon on c.i.f. terms. At these prices the article by the end of the second week in September was receiving but little attention. At the same time sellers show no inclination to give way, so prices remained around 51s. to 52s. 6d. for Cochin, and 46s. 9d. to 47s. 6d. for Ceylon. Palm Kernel Oil started steady with rather a poor demand. Later, however, prices fell 15s. to 20s. per ton lower, and at the time of going to press the position was described as getting interesting. There seems to be no pressed oil obtainable in first hands, whilst second-hand lots were said to be obtainable at 44s. 6d. for early delivery. Prices generally on September 13th ran as follows:—

	1913	1912	1911
<i>Palm oil (Liverpool):</i>			
Per cwt.			
Lagos	34s. 3d. to 34s. 6d.	31s. 6d. to 31s. 9d.	34s. 6d. to 35s.
Benin	30s. to 30s. 3d.	28s. 9d. to 29s.	32s.
Congo	28s. 6d. to 28s. 9d.	27s. 9d. to 28s.	29s. to 31s.
Bleached	33s. 9d. to 34s. 6d.	32s. 9d. to 33s. 6d.	36s.
Clarified	30s. 9d. to 31s. 6d.	29s. to 30s.	35s.
<i>Palm kernel oil</i>	43s. 9d. to 44s. 6d.	37s. 3d. to 39s. 6d.	40s.
<i>Coco-nut oil:</i>			
Cochin	61s.	40s. 6d. to 43s. 6d.	48s.
Ceylon	49s. 6d. to 50s.	39s. 9d. to 40s.	45s.
English pressed	44s. 6d.	36s. 6d.	38s. 6d.
<i>Copra oil:</i>			
Ceylon	None	39s.	43s.
Cochin	51s.	43s.	45s.

According to the *Public Ledger* of September 13th prices ruled as follows (per ton):—

Soya Oil.—Hull: Naked extracted, £26 10s. Oriental dull (in cases), July-August, £26 17s. 6d. c.i.f.; August-September, £26 17s. 6d. c.i.f.; September-October, £26 15s. c.i.f.; October-November, £26 15s. c.i.f.; November-December, £26 7s. 6d. c.i.f.; December-January, £26 5s. c.i.f. Antwerp.

Coco-nut Oil steady. Ceylon spot, £50 to £51; September-October, £47 5s. c.i.f.; October-November, £47 5s. c.i.f. Cochin spot, £60; September-October, £51 15s. c.i.f.

Palm Oil.—Lagos on spot, £37.

Palm Kernel Oil.—September, £44 10s.; October-December, £44 5s. f.o.b. Hamburg.

Soya Oil Beans.—Parcels Harbin spot, Hull, £9 1s. 3d.; November-December, £8 11s. 3d.; December-January, £8 7s. 6d.; January-February, £8 7s. 6d.; February-March, £8 7s. 6d.

Linseed Cakes.—London made, £7 17s. 6d. to £8.

Cotton Cakes.—London made, £5 16s. 3d. to £5 18s. 9d.

Copra dull. Malabar, October-December, £32 7s. 6d. value, and January-March, £31 15s. Hamburg. Ceylon, July-August, £33 12s. 6d. sellers, and August-September, £33 5s. Hamburg. Java, July-August, £32 5s. sellers; July-September, £32; August-

October, £31 10s., and October-December, £31 Holland, Hamburg and Bremen. Macassar, July-August, £32 2s. 6d. sellers, and July-September, £31 17s. 6d. Holland, Hamburg and Bremen. Singapore, August-September, £32 2s. 6d. buyers, and August-October, £31 15s. Hamburg. Cebu, August-September, £31 10s. sellers, and August-October, £31 7s. 6d. Hamburg. South Sea Island, July-August, £31 10s. buyers, and August-September, £31 5s. London. F.M. Straits, July-August, £31 12s. 6d. sellers; August-September, £31 7s. 6d., and August-October, £31 2s. 6d. Marseilles. Manila, July-September, £30 7s. 6d. sellers; August-October, £30, and October-December, £29 11s. 3d. Marseilles. Mixed no Padang, August, £30 10s. sellers, and August-September, £30 5s. Holland, Hamburg and Bremen, all c.f. and i. delivered weight.

Goodlake and Nutter report that the market has been very quiet, with sellers of Ceylon near at hand at 46s. 9d. c.i.f. London or Liverpool, which is the nearest quotation for more distant shipment. New York: Importers ask 47s. 9d. c.i.f. terms, and bids of 3d. less are solicited. Cochin: High prices asked. Buyers show little or no interest. We quote 53s. to 53s. 3d. for October-December shipment to London. Palm Kernel is dearer, and Pressed is offered at £44 10s.

The India-rubber Market.

As regards the price of rubber, claims *The Brazilian Review*, there seems no prospect whatsoever of this improving, in view of the ever-growing competition of the East. The most we can hope for is that, in expectation of a shortage of supplies from Pará and superiority of our own to Malay rubber, the prices of Brazil rubber may be kept from falling to the disastrous level of Plantation kinds, which are at present (August 12th) quoted at 28 per cent. below those of Fine Pará.

Against this, the following, from the pen of Messrs. Zorn and Leigh-Hunt, if amusing, certainly hits off the position exactly: "When Government departments come to hear of the existence of the rubber-planting industry of the British Empire—and the news will in due course penetrate the official mind—the restrictions which have hitherto existed in Admiralty and similar contracts will doubtless be removed, which will mean another important development for the plantation product.

"While the immediate course of the commodity market is still surrounded with much uncertainty, recent advices indicate that many more manufacturers are now beginning to buy the plantation product in consequence of its relatively low price compared with hard fine Pará. A steady development of this tendency is to be expected while the big discrepancy between the two products exists, and once manufacturers have adapted their mixings to plantation rubber (ample supplies of which they know can be relied upon in the future), there is very little likelihood of their going back to hard fine Pará, the supply of which is practically stationary."

Coming to market reports, we see that up at Liverpool the Pará market has been quiet and easier during

the week, and only small sales made, including hard fine spot 3s. 9d. to 3s. 8d.; September, 3s. 7d. to 3s. 7½d.; October, 3s. 5d. to 3s. 5¼d., and October-November, 3s. 3½d. per lb. Medium Brazilian grades have been more or less neglected. The *African* market has remained idle, with no business reported, and quotations are more or less nominal.

In London, according to Messrs. S. Figgis and Co.'s reports, prices realized at the auctions held on August 29th declined fully 2½d. per lb. from the previous sales, but there had been a considerable decline in private rates previous to this. The second day of the sale (August 27th), however, saw a recovery of nearly a penny per lb., closing with Standard Crêpe at 2s. 7½d. to 2s. 7¾d., against hard fine Pará, 3s. 9½d. spot; soft fine, 3s. 3d.; Caucho ball, 2s. 1d.

At the sales on September 9th to 11th, 775 tons of Eastern Plantation were offered (against 780 tons on August 26th to 28th), and the closing rates showed 2d. to 3d. per lb. drop on the previous sales, except for good smoked sheets, which realized comparatively high prices. Latex Crêpe is now 2s. 4½d. lb., against hard fine Pará, which is scarce, about 3s. 8d.; soft fine about 3s. 3d.; Caucho ball, about 2s. 1½d.; whilst plantation kinds sold as under:—

Malaya.—Crêpe, fair to fine pale, dull to good palish, 2s. 4½d. to 2s. 6½d.; light brown and grey, pale streaky, 2s. 3d. to 2s. 6d.; fair to good clean brown, 2s. 1¾d. to 2s. 5d.; dark and specky brown, 1s. 9¼d. to 2s. 2¾d.; dark and black, part pressed, 1s. 9d. to 2s. 0½d.; dark and black, inferior, 1s. 3d. to 1s. 7d.; dark to good smoked, 1s. 11d. to 2s. 5¾d.; cured by "Byrne" process, dark brown to good, 1s. 11d. to 2s. 6d. Sheets, fair to very fine smoked (Highland, 2s. 9½d. to 2s. 10d.), 2s. 8¼d. to 2s. 9½d.; damp, mouldy, and part smoked, 2s. 4d. to 2s. 8d.; fair to fine unsmoked, 2s. 5½d. to 2s. 6¾d.; damp, mouldy, and stuck, 2s. 2d. to 2s. 6½d. Block, fine pale Lanadron, 2s. 5½d. to 2s. 6d. Scrap and Virgin, fair to good, 1s. 4½d. to 1s. 7½d.; mixed and inferior 11d. to 1s. 4d. Rambong Crêpe, 2s. to 2s. 0½d.; scrap and block, 1s. 9¼d. to 2s.

Ceylon.—Crêpe, thick dull to fine (very fine, 2s. 8¾d.), 2s. 4¾d. to 2s. 7¼d.; fair to fine pale, dull to good palish, 2s. 4½d. to 2s. 6¾d.; light brown and grey, part streaky, 2s. 3d. to 2s. 6¼d.; fair to good clean brown, 2s. 1¾d. to 2s. 5d.; dark and specky brown, 1s. 9½d. to 2s. 2½d.; dark and black, part pressed, 1s. 8½d. to 2s. Sheets, fair to good smoked, 2s. 7¾d. to 2s. 9d. Sheets and Biscuits, fair to good unsmoked, 2s. 5¾d. to 2s. 6¾d.; damp, mouldy and stuck, 2s. 2½d. to 2s. 6d. Scrap and Cuttings, fair to fine, 1s. 4¾d. to 1s. 8½d.; mixed and inferior, 8d. to 1s. 3d.

The London Cocoa Market.

BY THE EDITOR.

WHILST no one can exceed me in my anxiety to encourage trade between the Mother Country, the self-governing states and our colonies, I am certainly dead against any fiscal changes or retaliatory duties that tend to injure any one colony, or even any particular industry in that colony. Yet this is what, according to the *Tea and Coffee Trade Journal* of New York, is likely

to happen to the Trinidad planters if the reciprocity treaty between Canada and the British West India islands is persisted in. As America is Trinidad's best customer for her cocoa, both as regards price and quantity, any legislation that tends to discourage or break up that trade must, I should imagine, be repealed. If Trinidad has to depend on Europe for the entire sale of her cocoa crop, I shall be sorry for the planters. On the top of two bad crops, they will have a period of very indifferent prices running down to the level of British West African, and all for the sake of a few hundred bags sent annually to Canada. You can have too much even of a good thing—and Imperial preference or inter-colonial reciprocity is no exception to this rule if it is to be purchased at such a cost to the Trinidad cocoa planters.

We certainly cannot claim to have had a busy time of it during the past month, either in London, Havre, Hamburg, or, from all accounts, New York. Bahia "bears" have been busy talking down prices, but it is doubtful whether the quoted rates, except for the unsatisfactory quality that has been coming forward at times, were reliable on a commercial basis; for instance, I should be sorry to have to deliver 500 bags a month during the next six months, at the prices quoted to me, but then some folks maintain that the Bahia crop this year (or was it the exports?) will be a bumper one; from reliable reports from Bahia such an opinion is too optimistical. From all I can gather the exports, in spite of the inclusion of old stock, will continue to go back until good rains are general and lasting through the bulk of the cocoa-producing areas, and so help "to pull the trees together," the same as they need in Trinidad (W.I.), to help them to bear well in six months' time. Between now and then, that is, between now and February, I cannot see that supplies can keep abreast of demand. Surely supplies for the time of year must continue to be restricted, and so cause competition and prices to go higher before they fall lower and remain there.

This idea was confirmed by comparing M. Alleaume's (of Havre) quotations for Accra kinds on August 15th and 31st. Although it was known at the end of last month that the eight months' exports from the Gold Coast amounted to about 27,650 tons (English), against 19,668 tons last year, and 19,177 tons in 1911 (and both of these previous crops are excellent and most creditable outputs), prices at Havre, instead of going lower like Bahias, went higher in company with Grenadas, Trinidads, and Venezuelan, and I think unbiassed investigations will prove that it is only the uncertainty as to out-turn of present shipments from Bahia (and not fear of over supplies) that is causing buyers to leave that centre alone as much as possible or bid lower prices, whilst being willing to give higher ones for other growths. Until Bahia can see her way to adopt modern methods for producing as well as preparing and drying her cocoa, she cannot expect to successfully compete against other centres that do so. For this reason I hope that Bahia, or at least Brazil, will be represented at the coming "Dry-farming" Congress to be held at Tulsa next month, or failing that, that the Director of Agriculture for Brazil will have the papers dealing with tropical agriculture translated into Portuguese, and distribute copies amongst the planters. If this is done many

planters will see how, even in times of drought, they can keep up their output, and also turn out better beans than the small, hard, water-starved ones that have been coming along of late.

Leaving production for consumption, I have worked out the following table for the eight months—January-August—of the six chief consuming centres shown. I am indebted to the Hamburg *Gordian* for the August estimates of the Continental centres, and for both July and August for America. They show, I regret to see, a falling off of about 4,200 tons compared to last year, the returns for America being particularly behind. This market, however, is a game one, and when it does wake up to make up for lost time, it does so with a will, and probably when the output of really good "stuff," as fine Trinidads or Superior Bahias increases, then America will buy freely and at good prices. The falling-off amounts to 6,700 tons, which at eleven bags to the ton is only some 73,700 bags, and that is not a great deal for the whole of the United States to make up between now and the end of the year, when one remembers that last year they required 904,000 bags for actual consumption during the twelve months, or an average consumption of 75,000 bags a month; but to return to the figures, these run thus:—

	1913.	1912.	1911.
U.S.A. ...	47,380	54,040	48,230
Germany ...	35,090	37,792	34,558
U.K. ...	18,072	17,722	15,855
France ...	18,808	16,717	17,271
Holland ...	20,885	17,667	16,518
Belgium ...	3,969	4,469	3,580
Totals ...	144,204	148,407	136,012

Taking the figures for the United Kingdom only, those for the month of August were very disappointing, for whilst the deliveries for Home Consumption of foreign manufactured cocoa showed an increase of nearly 120 tons for the month, those of raw cocoa were 521 tons behind (1,572 tons, against 2,093 last year, and 1,565 tons in 1911). Here are the eight months' figures:—

Raw Cocoa only—		Landed.	Del'd H.C. Tons.	Exported. Tons.	Stock (Aug. 31st) Tons.
Jan.-Aug., 1911—	23,832	15,855	4,399	13,003 tons	
" " 1912—	23,621	17,722	4,082	11,164 "	
" " 1913—	24,860	18,072	4,755	11,107 "	
Incr. 1,239		Incr. 350	Incr. 673	Decr. 57	"
Foreign Manufactured—		Landed.	Del'd H.C. Tons.	Jan.-August.	Del'd H.C.
1913—	998	860	7,657	7,229 tons	
1912—	788	742	5,979	6,178 "	
1911—	571	508	4,881	4,441 "	

Production figures work out as under:—

	1912-13.	1911-12.	1910-11
Trinidad ... Oct. 1st—Aug. 16th	Bags 227,021	214,200	243,604
Grenada ... "	" 62,801	69,585	65,313
	1913	1912	1911
Guayaquil ... Jan.—August	Qtls. 483,300	584,200	576,300
San Thomé (Lisbon) ... "	Bags 271,902	342,497	302,879
Bahia { Receipts Jan.—July ...	" 153,554	191,582	278,510
{ Exports " " ...	" 166,047	251,554	295,551
Gold Coast ... Aug. ...	Tons 27,650	19,668	19,177

Movements at Lisbon during August were as follows, according to Messrs Martin, Weinstein and Co.:—

Lisbon stock on July 31st ...	...	...	...	Bags.	72,924
Add landings in August ...	...	...	...		26,898
					99,822
Less delivered in August ...	...	...	...		49,340
					50,482
Leaves stock on August 31st, 1913	...	...	...		111,131
Against ,, ,, 1912	...	...	...

The London stock on September 13th was:—

	1913. Bags.	1912. Bags.	1911. Bags.
Trinidads ...	13,023	7,680	8,873
Grenadas ...	5,368	4,607	12,217
Other W.I. ...	4,518	12,556	7,398
British Africa ...	9,672	6,258	3,928
Portuguese Africa ...	4,654	8,580	3,698
German Africa ...	2,253	7,078	7,341
Ceylon and Java ...	17,716	16,909	16,196
Guayaquil ...	13,143	41,072	42,978
Brazil and Bahia ...	703	3,027	1,493
Other Foreign ...	9,743	9,313	11,522
Totals ...	80,796	117,080	115,644

	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
<i>Havre Stock, August 31st—</i>				
Pará ...	13,036	80 to 85	7,274	82 to 84
Bahia ...	7,717	78 ,, 84	5,337	75 ,, 82
Venezuela ...	59,563	85 ,, 200	48,294	83 ,, 200
Trinidad ...	24,835	85 ,, 90	31,522	84 ,, 90
Grenada and O.W.I. ...	2,896	80 ,, 85	3,983	69 ,, 83
San Thomé ...	4,910	84 ,, 86	5,239	77 ,, 79
San Domingo ...	8,637	73 ,, 80	9,949	69 ,, 74
Haiti ...	5,772	69 ,, 80	10,791	62 ,, 76
Accra ...	47,681	77 ,, 80	45,137	69 ,, 73
Guayaquil ...	16,383	79 ,, 86	17,732	73 ,, 83
Others ...	13,582	—	5,214	—

Totals ... 205,012 bags 190,472 bags

Values, including business done up to September 17th, run as under:—

Trinidads.—Fine to superior marks have been selling at 76s. to 77s. 6d.; mid. to good mid. red are valued at 70s. to 74s.

Grenadas.—Fine have sold up to 68s., but some value at 67s.; whilst ordinary to good fair are worth about 63s. to 66s.

Jamaica.—Fine red has been selling at 68s.; good red marks are worth 65s. to 67s.; ordinary unfermented to fair fermented, 62s. to 64s.

St. Lucia.—Fine are worth 68s. or 69s.; common unfermented down to 62s.

Dominicas have been selling well up to 68s., with ordinary to fair at 62s. to 64s.

Costa Rica.—Bold realized 75s.; good reddish, 67s.

Demerara.—Good reddish, 63s. 6d.; fine, 69s.

Bahia.—On the equivalent of Grenadas are worth 67s. to 68s. for superior.

San Thomé and Cameroons are worth 65s. to 66s. or 67s., according to flavour.

West Coast Africa.—Sales at Liverpool seem to hang a little, buyers being unwilling to believe that the present prices demanded are not too high. The last sales included Accra kinds at 56s. to 60s., against 62s. for good fermented paid in London.

Samoa.—Good boldish sold at 78s.

Java is much lower (so are fine Samoa and Ceylons). Good bold sold at 85s., and fine are worth 90s. or less.

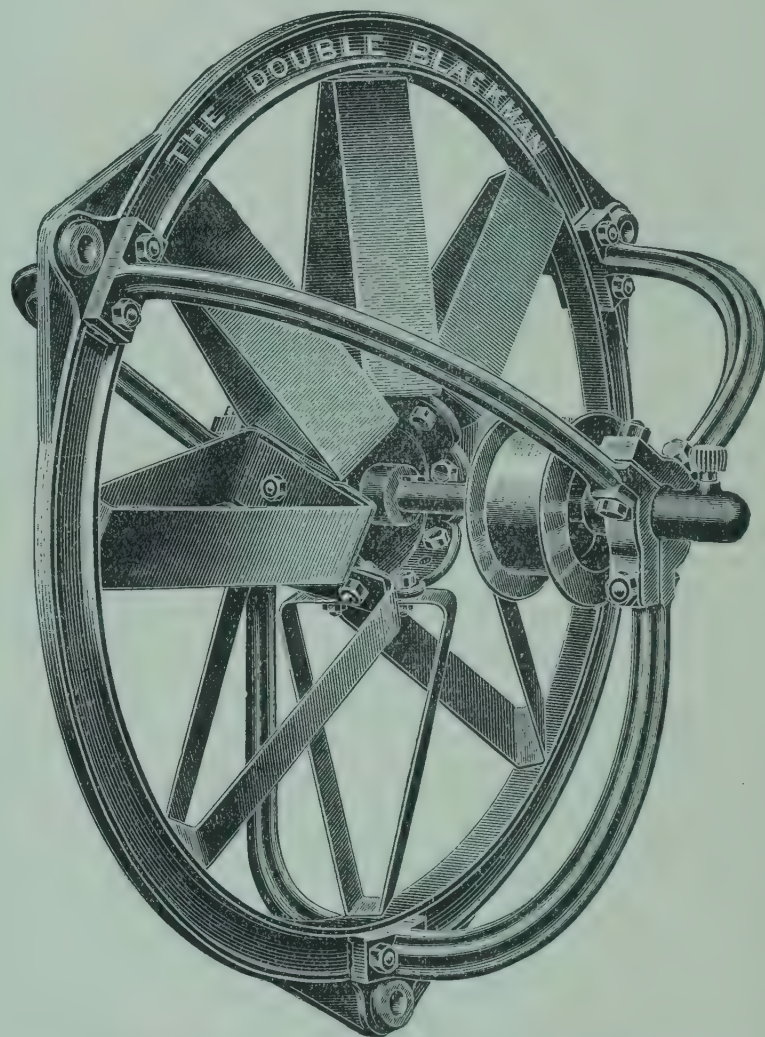
Ceylons.—Fine sold at 93s. at the beginning of the month, but I do not value at that now; fair to good bold are worth 77s. to 85s.

Guayaquils.—No sales reported. Arriba are valued at 72s. to 76s.; Machala, 69s. to 72s.; Caraquez, 70s. to 74s.; but in the absence of any reported business these prices are quite nominal.

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Our Books.

WANT of space has caused us to hold over the reviews of our recently issued book on "The Fermentation of Cacao," &c. Orders for same have been coming in at a gratifying rate, and, judging from the comments in the notices, the book has been found useful in the way we hoped that it would be.

As regards the second edition of the "Coco-nut" book, this is being pushed on with all speed, but will take rather longer than we at first anticipated, as we have, by special request (as the concert programmes say), included a special section on "Farming by Dynamite," in which the advantages of the use of explosives in modern agriculture will be fully discussed, and estimates given showing the cost entailed. Other new chapters will include one on the cost of making copra, whilst the last word on manuring, on the solvent extraction of oil, and of prices of coco-nut products will be added. Several new plates will be found in this edition that are not in the first one, including one of the Rhino beetle from Mr. Jepson's useful report on that pest in Samoa, besides others that we think will interest our readers.

The British Dominions Exhibition.

TO BE HELD IN LONDON IN 1915.

THE Editor of TROPICAL LIFE has accepted the invitation extended to him to join the Grand Council of the British Dominions Exhibition to be held in London in 1915. With this has been incorporated the Imperial Exhibition, and the collection of exhibits will be made up of the products and manufactures of the Empire, *i.e.*, of Great Britain and Ireland, of the self-governing States, of India, and our dependencies overseas. Lord Strathcona is the President, and Captain Sir Pieter Stewart-Bam is Chairman of the Administrative Committee, of which Mr. Cecil Beck, M.P., and Mr. P. J. Hannon are joint Hon. Secretaries. The Council includes representatives of the overseas dominions and upwards of 800 supporters drawn from all parts of the Empire.

The Exhibition has been described as a "stock-taking" of the natural resources and principal industries of H.M. Dominions, and the year 1915 was decided on for the following reasons among others:—

(1) It will be the year during which the next quadrennial meeting of the Imperial Conference takes place in London.

(2) It will be the year in which H.R.H. the Prince of Wales celebrates his twenty-first birthday.

(3) It will be the Centenary of the Battle of Waterloo.

(4) It should see the publication of the Report of the Empire Trade Commission.

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Three teams of three-disc Conqueror ploughs. Breaking

Ploughing in North Rhodesia.

MODERN ploughing in Rhodesia, more especially when breaking virgin soil, presents in many respects a scene seldom to be met with in other parts of South Africa, and (we believe) never seen outside the black continent. Scenes such as the one depicted above and below are, however, commonly met with in Rhodesia, and with the characteristics of the country, coupled with the peculiarities of its natives, they imprint on the memory of the visitor a tableau that is often recalled when the mind turns to matters Rhodesian.

With regard to the type of implements used, disc ploughs are in great evidence throughout all parts, being more generally used than any other type; and in those centres which are now settled, but which only a few years back were practically unknown to white people, you see spans of sixteen and even eighteen oxen at work drawing disc ploughs of three and four furrows, and breaking up some of the richest soil in the world.

Previous to the advent of these disc ploughs into South Africa, it was necessary for the farmers to wait for Nature to come and assist them by supplying rain to soften the ground sufficiently for them to plough it; but the rain is not always available, and though Nature is kind as a rule, she does not always shower her gifts on us when we need them the most, and at no time, short of actual drought, are rains more neces-

sary than when needed to soften the ground for ploughing. Disc ploughs, however, have now almost, if not entirely, helped the farmer to solve the difficulty, for with their help the land can be ploughed at any time of the year, except in the case of extremely stiff soils, and thus rendered able to receive the rain, and keep it for future use after it has fallen. The disc plough, therefore, renders the farmer a double help: it enables the land to be well cultivated at any time of the year instead of the work being rushed through during one short period, and, this being done, when the rain does come the land is in the very best condition to receive it.

The photographs shown were not specially taken for us, but sent, with others showing the settlers and family "on trek," by an ex-Rhodesian planter or farmer. The one at the top illustrates three 3-furrow disc ploughs, known as Ransome's "Conqueror," at work breaking fresh land in Northern Rhodesia. These implements, which are supplied in various sizes by our old friends, Messrs. Ransomes, Sims and Jefferies, Ltd., of Ipswich (Eng.), being extensively used, are to be seen at work in all parts of the world, but are extremely popular amongst the Rhodesian farmers on account of their excellent capabilities for ploughing the hardest and most difficult soil. This is done as follows:—

The new settler or farmer, after selecting a favourable area of his perhaps newly acquired farm, proceeds to cultivate it, and can be seen directing his



A three-disc Conqueror plough and



up and cross-ploughing the veldt in Northern Rhodesia.

"boys" (natives) how to throw down and disperse the larger ant-hills, some of which run from 3 to 6 ft. high; large roots and stumps are also removed by the monkey jack or stump grubber, together with any rocks, boulders, &c., that would damage the ploughs and impede progress generally. Of late years it has become customary to use dynamite to blow out and break up these obstacles, and its use has proved a great advantage to those who understand how to handle explosives.

Disc ploughs have the advantage with the Rhodesian or other native, that if the white owner or overseer sets out the first furrow in a straight line the native ploughman has no difficulty in keeping straight, as the heavy plough frame resting on the wheels in the furrow automatically preserves a fairly straight line. When breaking up the virgin veldt a depth of 5 to 7 in. is usually reached at the first ploughing, and 8 to 10 in. on the second one. As a rule one and a half to two acres a day can be broken the first time over, and two and a half acres with the second cultivation. The cost, in Rhodesia, varies slightly according to the rate of wages paid and the price of rations; but on an average, allowing £4 a month for the driver, it should run around 7s. 6d. a day, exclusive of wear and tear of the implement.

In estimating for a day's work, it must be remembered that owing to the scarcity of fodder in the dry season and the great heat at midday, ploughing is usually done during the four hours after sunrise and

the four before sunset, a few farmers even ploughing at nights when the moonlight is sufficiently bright to enable them to do so. This plan gives the oxen all day to rest and feed in, whilst both natives and animals work better during the cool hours of the night.

Success or failure depends largely on the ability of the settler to feed his cattle. Heavy work and short commons prevent the cattle from filling out as one sees in England. Owing to the difficulty and expense of cutting fodder the oxen are seldom fed in the kraals, but depend for their feed on what they can pick up during the day; to overcome this trouble, a few farmers are wisely importing mowers and using them to cut the grass. This reminds us that on p. 129 in our book on "Coco-nuts" we call attention to the use of the mowing machine in the German colonies to keep down lalang grass; whilst Dr. Preuss, in his book "Die Kokospalme," includes a good-sized photo of an all but naked native working a mowing machine attached to two oxen on an estate of the Neu Guinea Cie in the Bismarck Archipelago. That there are machines, therefore, to do such work is beyond doubt.

This being so, our Rhodesian friends should surely be able to improve on the present system generally in vogue, of leaving the animals to pick up what little they can when out of the kraals and not working. Until green fodder can be raised it ought surely to be possible to give the animals some cut feed in the kraals as well. As it is the grass must be a nuisance,



cattle team in Northern Rhodesia. (16 oxen to a team or span).

running up to some 8 ft. high, so that, unless it has been previously burnt off, it completely hides the plough, the animals, and the men from view as they go along, unless, perchance, they go over an ant-hill, and appear in view for a moment ere dropping down again on the other side.

Taking virgin veldt the idea would be to burn off a larger area than you wish to plough, and then, as the new and young succulent grass came up, run the mower over when a few inches high and utilize that for the cattle. The cost of such fodder ought surely to be recovered in stronger animals, more work done, and fewer of the cattle on the sick list, hence fewer to be purchased.

Ploughing done and a considerable area being thus laid fallow, the sun and rain are left to do their work in rotting the piled-up grass and breaking down the furrows. Cross-ploughing then takes place, followed by cultivation with horse-hoes, disc, and teeth harrows, whilst light soils can be rolled with a "Cambridge" or other roller to break up the clods, and give a fine tilth for the seed bed to produce the first crop. Maize is the staple crop, and yields from five to ten bags (each 200 lb.) per acre, although land in some favourable spots has been known to grow as much as 15-20 bags per acre, according to the rainfall and the quality of the land. A large proportion of Rhodesian maize is exported to the Congo, where animal-drawn ploughs cannot be used owing to the prevalence of the tsetse-fly. A little tobacco and cotton are also grown.

AMERICA has issued several consular reports calling attention to the excellent and increasing demand for spraying machines in the Tropics. One of the latest calls attention to the pressing demand in Mysore for knapsack sprayers to combat the green-bug pest, and suggests that those interested should communicate with the Director of the Department of Agriculture of Mysore and the Secretary of the United Planters' Association of Southern India at Bangalore, Mysore, India, and also with the Director of the Department of Agriculture of the Madras Presidency. Amongst other orders was one for 100 machines, whilst recent sales, in the aggregate, must have exceeded that number several times over.

Our old friends, Messrs. Bovril, Ltd., have gained double honours on Belgian soil, having been awarded the Grand Prix at the Ghent Exhibition, and also a Diploma for excellence at the Congo Belge Exhibition, Elizabethville. This double distinction, which heads a long list of previous awards, is certainly a high tribute to the excellence of this now world-famous beef beverage.

ONE of the wisest messages ever sent to a young country was that by President Roosevelt when he warned Australia against the danger of keeping her north unpeopled and undeveloped. Just as Nature abhors a vacuum, so the progressive races will not tolerate fertile tracts of the earth being left undeveloped. —R. N. LYNE (p. 227), in his book on Mozambique.

The Cultivation of Cacao. No. XXIX.

IF Castilloa can do well in the Philippines with Manila hemp (*Musa textilis*) for shade, so will, according to the *Journal of the Jamaica Agricultural Society*, young cacao plants succeed best if planted out through bananas, also a *Musa*, as they must have a certain amount of shade from the hot sun when young, and the banana will answer satisfactorily for that purpose and enable the cacao to be grown economically. This is how we have planted estates, using manioc or tapioca cuttings bent over the cacao seeds planted "at stake," to shade them with the one or two leaves that the cassava cuttings throw out very soon after planting, and which protect the cotyledons as they appear above the ground. Meanwhile, the bananas, which must be planted before the cacao, are coming on to form the second series of shade, the *Erythrina* or Immortelle trees, also called "La Madre del Cacao," forming the third and permanent shade. Moreover, if the land has been laid out for bananas and these have been properly cultivated, the soil will be already in good condition, and need no further preparation before planting. See, we are warned, that the land is properly drained, especially if it is inclined to be wet or if it is of a stiff clayey texture, otherwise the soil, in wet weather, becomes sodden and sour, and the cacao trees will not thrive when the soil is water-logged and sour. Choose land that has a good soil, deep because the trees send down a tap root which, although not assisting to feed the tree to any great extent, will greatly affect its health if it comes into contact with an impenetrable bed of marl or rock.

Avoid bleak, windy situations, for cacao trees love shelter and suffer greatly from the effects of strong winds, which cause defoliation and also injury to the tender young shoots. Valleys sheltered by hills and rocks, and stretches of land protected by good belts of timber are ideal situations if in a good rainfall.

Do not follow the examples of others and plant too close, for cacao trees need light and air in abundance, and will never pay for overcrowding. On good rich land we would advise planting 12 to 14 ft. apart in the rows, and on poorer soils or on hillsides where the trees will not grow so big, 11 or 12 ft. apart will not be too close. At these distances the trees should almost touch when fully grown, and there will be ample space for the free circulation of light and air so needful for the healthy growth of the trees and full crops of pods. In addition, the trees will shade the ground nicely, keeping it cool and moist and also preventing an excessive growth of weeds. Of course the distance between the rows will depend on what distance the bananas are planted, as the row of cacao trees will run between each row of bananas.

First, line out the rows methodically, and place a peg where each hole is to be dug. Large holes should always be dug to receive the plants, and we strongly urge digging them the size given below, about a fortnight to three weeks before planting. Good holes are important. They should be made at least 2 ft. square and 18 in. deep, and the soil must be well turned out so as to expose both soil and hole to the beneficial action of sun and air. Then, just a few days before planting fill in the hole with good

surface soil, making its top area a little higher than the surrounding land to allow for sinkage. Unless this precaution is taken, when the ground sinks there will be a depression round the plant in which water will settle and cause the stem to rot away.

When putting out plants grown in bamboo pots, a writer in the *Tropical Agriculturist* of Ceylon tells us, great care must be used so that the plant shall receive as slight a check as possible in transplanting. Take care to see that the soil in the pot is well soaked before removing the plants. Place them for a few minutes in a pail of water to soak and stand them aside to drain. Next, neatly reverse the two halves of the pot, make a good hole in the loosened soil with the hand and insert both pot and plant carefully. Do not plant too deep or too shallow, but sink the pot until its top is level with the surface, pressing in the soil round it. Then gently withdraw the two reversed halves of the pot, making everything quite firm and tidy afterwards.

The great advantage of preparing a good deep hole and careful planting is very soon apparent, for the plant makes a good start in the sweet loosened soil and grows away at a vigorous rate. One cannot too heartily condemn the slipshod method often adopted of simply chopping a hole with the hoe, pushing in the plant with perhaps all the soil shaken off its roots, and then leaving it to take its chance. It is hardly to be wondered at that most of the plants, instead of progressing, gradually die out until the cultivator who put out a hundred plants eventually finds that he has only a dozen or so growing plants left. By following this simple but very safe method, every plant should grow and in a few years form a uniform and profitable plantation. Keep a few plants in pots for renewals.

Spray Machines Again to the Fore in Southern India.

FOR some time past the areca-nut gardens on the West Coast (Southern India) have been ravaged by disease, reports the *Madras Mail*. After a continuous rainfall this disease, known as *Maghali* in Kanarese, makes its appearance by an ashy-coloured coating over the bunches of areca-nuts and spreads very quickly. Mr. Bainbrigge Fletcher, the Entomologist to the Government of Madras, and his assistant, Mr. Sundaraman, visited the localities on a number of occasions, and their visits are now producing good results in combating this destructive disease. The remedial measures these officers followed was that of a mixture of copper sulphate solution and quicklime on the nuts before the monsoon and during the break of the monsoon through a compressed air spray carried by the climbers; resin (adhesive) is also applied to prevent the sprayed solution falling off in the rains. This gives an antiseptic coating which protects the nuts. No fewer than 7,000 trees have thus been treated, and the results in the gardens so treated are clearly seen by the disappearance of this disease. A large number of ryots are now applying for machines and the mixture, and certain garden owners are being supplied with them. Some of these garden owners are acquainted with the process of application, while fieldmen are dispatched to stations wherever necessary with sprayers and solution.

Coco-nuts and Pestalozzia Palmarum.

REFERRING to the notes under the above heading in our issue for August (p. 145), we have received the following from a planting expert in the West Indies, to whom we sent a copy of our Journal:—

“In regard to the question of kainit for diseased coco-nut trees, there seems no reason why it should not do the same as common salt, and I always recommend it. We must keep in mind, however, that it is not practicable to use either kainit or any other chemical for rectifying improper physical soil conditions.

“This disease, described as *Pestalozzia palmarum*, as well as all others causing, what is usually termed, bud-rot, is nearly always prevalent on unsuitable soils, and practically absent where the natural conditions are favourable for the coco-nut palm.

“In the case referred to in your paper the soil is unquestionably the cause of the trouble. As far as I remember I visited the place at one time, and was not very favourably impressed with the conditions.

“I tried kainit on trees similarly located in the Isle of Pines three years ago, and it has since been reported that none of those trees died for two years. The dose was repeated about a year ago, but several of the trees have died since.

“The theory of placing a bag of salt in the heart of the tree seems plausible, provided the disease is carried by insects, and in that case, of course, kainit would do as well. In applying kainit to the roots, we naturally suppose that potash is needed, but I have seen nothing to substantiate that theory in places where I have observed diseased trees. The real question is not plant foods, but suitable soil.

“In regard to kainit *versus* muriate, I always recommend the latter out here in the West Indies, because of the great difference in price of K_2O . In muriate it amounts to 3.27 cents per lb., while in kainit it is 4.88 cents per lb.”

Where Labourers will soon be Available.

AGRICULTURE in many tropical centres is, as is well known, starving for want of labour. Where negro labour, as in British Honduras, is suitable we would recommend the authorities to follow the example of Louisiana.

Commissioner of Agriculture and Immigration, Hon. E. O. Bruner, the *Louisiana Planter* tells us, has recently taken a most important step that it is believed will redound greatly to the benefit of Louisiana. If there be anything from which Louisiana is now suffering it is for a competent supply of ordinary labour. The early completion of the Panama Canal implies the gradual distribution of the many thousands of labourers now congregated there. Seeing this, and appreciating its importance, Commissioner Bruner has sent his chief deputy, Hon. Justin F. Denechaud, to the Canal Zone, to study the conditions relative to establishing a Louisiana Immigration Office there, and it would seem probable that if the Commissioner can secure the right sort of man for the purpose he will take immediate steps to send some thousands of good, able-bodied men to aid in tilling the fertile soils of Louisiana. If it pays America to do such things, why not recruit the men for our own colonies?

TEA NOTES.

THE struggle going on between East and East and East and West for supplies of Indian coolie labourers is exemplified in the last report of the annual meeting of the United Planters' Association of Southern India, where we are told that: "The way in which the Government assist overseas recruiters while throwing obstacles in the way of recruiters for Indian districts is one I have alluded to before both here and in Council. I see that the same complaint is being made up North, for in a recent issue of *Capital*, speaking of the tendency of the Indian to emigrate to countries where he is not wanted, and the shortness of labour in planting districts, that paper remarks: 'Let them read the Report of Dr. Banks, Protector of Emigrants, Calcutta, for 1912, and they will see how Government officials deliberately encourage coolie emigration to the West Indies, &c., whereas they put every obstacle in the way of coolies going to Assam.'"

All producing districts are more or less faced with the same labour problem to meet the ebb and flow of their requirements, and it is a curious anomaly that, while there are millions of the agricultural classes struggling to make a precarious living in congested areas within the Continent of India, there should be the cry for labour from the tea districts, which offer to these very classes a life of comparative ease and affluence, with prospects of acquiring land on easy terms and assured crops. The difficulty seems to be in bringing the two interests together, and in some way overcoming the strong home-loving propensities of the "raiya," who is by nature devoid of ambition, and who knows nothing of the world beyond a narrow radius from his village. Time, education, and improved communications may do something to remedy this state of things, but in the meantime Government could do much, could it be induced to take a more practical interest in local industries and emulate the Colonial Office at home in a sustained and successful assistance towards the industries under its charge, and its willingness to help planters to secure the necessary labour, so long as the natives are properly looked after and receive fair remuneration.

Weather conditions in Northern India in the earlier part of the season were unfavourable, and a general shortage in crop seemed probable, but with better weather during the last two months the position has altered, and telegraphic advices of exports for the first time show an increase of some 2,000,000 lb. It is too early to make any forecast as to whether this increase will be maintained or exceeded, but with the present strong statistical position as regards both exports and deliveries for home consumption the outlook, even for a somewhat increased crop, is encouraging.

In spite of increased offerings and some falling off in quality the market has fairly well maintained its position, demand remaining active, and if the balance of crop is offered in quantities with which the trade can conveniently deal, there should be no material lowering in prices.

The Government of India has lately issued its annual paper for 1912, dealing with the production of tea in India, and it presents some interesting features. It shows an increase of area under tea of 17,250 acres since the previous year, while the production has

increased by 27,345,000 lb., being the largest increase in any single year in the history of the industry. In exports there was an improvement to Russia, Germany, Austria-Hungary, Italy, and Roumania, of which Russia continues to lead the way with an increase of 25.4 per cent.; while Belgium, Denmark, France, and Holland took somewhat smaller quantities. The United States took some 839,000 lb. less, but China increased her demand by some 4,000,000 lb.

The report on tea culture in Assam for the past year is unusually short, but shows a condition of quiet but steady progress in all directions. The total net area of land opened was 6,955 acres, with a small advance in meeting labour requirements, the increase amounting to 16,124 persons during the year.

As regards sales, the London market presented no important features at the beginning of October; prices have followed quality, which is gradually declining; the increasing weight of ordinary medium kinds from India has influenced some irregularity, and an easier tendency is discernible amongst teas coming within this category; common tea has barely maintained its position. Though the general trade is good there are indications of caution on the part of buyers in view of larger imports and improved crop advices from India.

At the sales during the week ending October 11th sellers showed themselves disposed to meet the market, and on the lower level of values established a fairly good general demand existed. Fair common and good qualities were not materially affected, any downward movement in quotation for the latter being commensurate with declining quality. Comparing prices with those ruling a year ago, good tea as a rule is still on a higher basis, but mediums have now about reached the same level; common tea, however, is dearer, standard whole leaf grades being about $\frac{1}{2}$ d. per lb. higher. The average for the whole sale of Indian teas on Garden Account was $9\frac{1}{4}$ d. per lb., against $8\frac{7}{8}$ d. per lb. last year, whilst Ceylon realized $8\frac{7}{8}$ d. per lb., against 9d. per lb. last year.

Regarding the production of tea in India, in calling attention to the report mentioned above, Messrs. McMeekin and Co. point out that "the increase in production was not attributable to new cultivation so much as to improved agricultural conditions over the whole producing area, as shown by the advance in the average production per acre from 503.8 lb. in 1911 to 544.7 lb. in 1912. The possibility of such a large increase in yield from old areas taking place under favourable conditions has been repeatedly pointed out in these notes, and it is fortunate for producers that it came when the relative conditions of the world's supply and demand were such as to facilitate ready absorption of the excess. It is stated that of the 592,000 acres under tea, no less than 47,026 acres were not plucked either because the bushes were too young or for other reasons. As 545 lb. per acre cannot be considered an unduly high average for old tea there are still considerable possibilities of increased yields, irrespective of what may be looked for when all the large unbearing area comes to contribute its quota."

To secure a continuation of these increased yields, planters when applying manures must see that the right proportions of the various plant-foods are given to replace those removed in the crop.

Reviews.

THE REPUBLICS OF CENTRAL AND SOUTH AMERICA.

By C. R. Enock, C.E., F.R.G.S. 521 pp., with many illustrations and maps. Price 10s. 6d. net. J. M. Dent and Sons, Ltd., London, and Charles Scribner's Sons, New York.

We hope this book will have a wide circulation, for although the author only mentions *en passant* the decreased interest individual Englishmen are taking in Latin-America as a coming centre of trade worthy of every attention, various paragraphs here and there prove conclusively that this country, or rather let us say the rising generation of this country, is neglecting the right of heritage that is theirs by purchase (at the cost of £940,000,000, as Mr. Enock points out on p. 11), and allowing it to be consumed by others. On p. 68, for instance, we are told that in Sao Paulo alone there are 1,000,000 Italians, and that as far back as 1906 there were at least 350,000 Germans in Brazil, and some say 500,000 (p. 69), whilst out of the total immigration into Brazil during 1911 (134,000) only 5,850 were British. This is not satisfactory, nor are such sentences as the following (p. 361): Coffee machinery into Colombia and Venezuela has mainly come hitherto from England, but recently American manufacturers are obtaining a foothold. On p. 171 we learn with regret that the commercial and social influence of the British community in Argentina is held to be waning, and yet we have no less than £330,000,000 invested in the Republic whose capital, Buenos Aires, we are reminded on p. 140, is one of the principal, certainly one of the best-known centres, of the "white slave" traffic. It seems a pity that the powerful influences this country still wields over Argentina cannot remedy this. In the chapter on "Foreign Relations and Commerce" these matters are fully debated. Whether the fault lies with the authorities there for not exterminating the pests, or with authorities in Europe for not preventing the kidnapping more efficiently, it is not for us to say. Buenos Aires is, however, not the only plague spot by any means, and as well-wishers for Latin-America we would suggest that "white slavery" be vigorously put down at those centres where it is well known to exist in South America.

Coming to matters more congenial, though still unsatisfactory, we regret to see that in Montevideo (p. 178) the British element tends to decrease numerically, although it embodies the principal financial and commercial interests, for we have some £46,000,000 invested in Uruguay.

Until Latin-American agriculturists are freed from the grip of the land barons, which in some centres is no better and may be worse than the harshest rule of the *conquistadores*, the continent as a series of nations will never prosper. Until the law compels the lands to be utilized or to revert to the Governments to be let or given to squatters, no benefits worth mentioning can accrue to the rank and file of the inhabitants, nor to the revenues of the country, and it is only by improving the lot of the many that real prosperity can come to any people. This is driven home to us in every section of the book. We only hope it will be noted equally carefully by the authorities of the various Republics. We are pleased to see this addition to Mr. Enock's goodly list of books

on Latin-America,* and only hope it will be extensively read and seriously considered. There are many lessons for the English to learn from its pages, lessons too, of which most of them seem sadly ignorant.

Whilst sociological conditions are fully dealt with, the book, on the other hand, describes in detail the topographical, industrial, and climatic features; and, indeed, every phase of the life of the Latin-American Republics, from Mexico and Central America to Brazil, Argentina, and the other South American Republics.

PALM OIL AND KERNELS, "The Consols of the West Coast": being an Exposition of the Palm Oil Industry, its Romantic Development and Commercial Possibilities. By Harry Clyde Billows and Harold Beckwith. 109 pp. Price 1s. net, or 1s. 3d. post free. Charles Birchall, Ltd., 17, James Street, Liverpool; or TROPICAL LIFE, 83-91, Great Titchfield Street, London, W.

The low price charged for this book, of which, we are told, 10,000 copies have been printed, may prejudice some of our readers against it, as more than one book has been issued on tropical products lately at 1s. or 2s. 6d. beautifully illustrated and printed, but unmistakably published for company promotion purposes; the book under review, however, is not one of these. It contains no attractive coloured plates, or "fetching" pictures by artist and writer of the romantic side of tropical undertakings, but is filled from cover to cover with a continuous series of carefully worked out tables, analyses, and official returns. The best-known authority on the oil-palm, its cultivation and exploitation is, undoubtedly, Dr. Soskin, whose writings for the German Tropical Committee in Berlin still stand prominently ahead of any competitor. As the pioneer "Peter the Hermit" to preach to modern Europe the rosy prospects offered by the systematic exploitation of oil palms, Dr. Soskin was already well known to us in 1905, and we still have the figures he then discussed with us under the shadow of Notre Dame in Paris, where we first met as fellow delegates to the International Tropical Agricultural Congress. Remembering this, we suggested, after reading Messrs. Billows and Beckwith's book, that a copy be sent to Dr. Soskin in Hamburg, feeling sure that he would find it as useful as we have done, and shall continue to do.

We would say that the main objects of the authors is not only to show the large profits—100 per cent. is suggested—that can be made by scientifically exploiting the oil-palm, but also, and perhaps principally, to call attention to how the possession of such profits can be facilitated and assured by the use of modern scientific methods and improved mechanical processes for obtaining the oil with the least waste of time, money, and oil.

Mr. Beckwith, in sending us our copy for review, pointed out that the idea of the sub-title, "The Consols of the West" (*i.e.*, the West Coast of Africa) was borrowed from "Consols of the East," used for

* This includes "The Andes and the Amazon," "The Secret of the Pacific," "Mexico," "Peru," &c., &c.

our book on "Coco-nuts."* His share of the book deals with the machinery necessary, and his instructions and suggestions, together with the valuable tables of costs and outputs that he so ably sets forth, must be carefully studied by all who wish to exploit the oil-palm and its products to their utmost advantage. Mr. Beckwith has had twenty-two years' experience as an advisory and consulting engineer, and has paid particular attention to the production and extraction of vegetable oils and the machinery and plant used for such work, whilst Mr. Billows has had equally sound experience in the use of the machines and the handling of the produce in West Africa. As we hope to be able to discuss the contents of the book in future issues, we suggest that our readers should at once secure copies so as to be able to compare their views with our own when we publish them later on.

THE PHILIPPINE COCO-NUT INDUSTRY. By O. W. Barrett, Chief, Division of Horticulture, Bureau of Agriculture, Manila, Philippine Isles, being *Bulletin* No. 25. 67 pp., 20 full-page photographs.

The above and those of its twenty-four predecessors that are still in print are, apparently, available for free distribution, thanks to the courtesy and generosity of the Americans in the Philippines; all communications to be addressed to the Director of Agriculture at Manila.

There is a good deal in this book which we have already called attention to in our book on "Coco-nuts,"* and there is much that we have not and are not going to include, first, because the new edition will be large enough as it is, and secondly, because it would not be fair to Mr. Barrett to do so. We do hope, however, since we believe in spreading out both our men and capital, that when the world sees Sir William Lever's new Foreword to our second edition, and realizes that edible butter seems likely to "lick up" all the oil and copra at present exported, leaving the soap-makers still to be provided for, the Philippines as well as our own dependencies will draw Englishmen and English capital to make use of their undeveloped resources and opportunities to open up coco-nut estates there on lines which we believe cannot be equalled elsewhere; that is, provided suitable labour be forthcoming and the estate is outside the typhoon area, as in the Visayas or central portion of the Archipelago, whereas the big island Mindanao and the Sulu Archipelago, stretching away down to Borneo, are coming, we are told, to be ideal locations for coco-nuts.

Mr. Barrett was always great at figures and estimates, as witnessed by his notes deploring the amount of "pin-money" lost to estates by their ignoring the value of mulches and other refuse at present allowed to run to waste; we think he put the last at some £800,000,000,† an amount which he truly says is worth saving. Now he launches forth again *re* the actual and possible output of coco-nuts when he

tells us, on p. 10 of the bulletin under review, that "if all the coco-nut trees of the world gave forty nuts apiece we would have the tremendous crop of ten billion nuts per year (we believe an American billion = 1,000,000,000), or well over 300 nuts per second. These, if laid end to end, would form a line reaching around the earth ninety times, which would make a broad belt some 20 metres or 65 ft. wide over land and sea. At present the Philippines are producing something like 175,000 tons of copra, or about one-fourth of the world's total copra output, whilst the export value of this article was 46 per cent. greater in 1912 (financial year) than in 1911." Mr. Barrett estimates that the Philippines have 50,000,000 trees bearing and otherwise, against 60,000,000 in Ceylon, where local demands heavily curtail shipments, some 500,000,000 nuts = 80,000 tons of copra being consumed fresh in the island, whilst the world is said to be consuming 1,750 tons of copra a day.‡

With these brief notes we must close, for Mr. Barrett's bulletin has already caused us to give up more space to it than we ought to have done. We are much obliged to him for causing it to be published.

Cacao in the Philippines.

As a result of increasing inquiry from the United States and of a realization of the demand in the Philippines themselves for the product, reports the *October Journal of the London Chamber of Commerce*,§ a determined effort is being made under the auspices of the Manila Merchants' Association to stimulate the production of cacao in the archipelago. According to an American consular report there is scarcely a district in the islands which is not more or less suitable in soil and climate for the cultivation of the bean or in which the bean is not already grown successfully. Large quantities of chocolate are used by the Filipinos themselves, for in spite of this general local production the islands in the last fiscal year imported crude cacao to the value of \$308,191, as compared with a value of \$243,270 the year before, and prepared chocolate to the value of \$10,628, the preponderance of the imports of crude cacao or cacao beans indicating the extent to which the product is

‡ Whilst writing these notes the post brought the *Ceylon Observer* of September 13, by which we see that returns made by the Committee of Agricultural Experiments plainly show the marked divergence both in the number of nuts per tree and also in the yield of copra per nut, and the serious reduction adverse climatic conditions can bring about in the output of copra from a given number of nuts. Quoting the *Ceylon Observer's* report, we are told that there was a steady falling off in the yield for the last three pickings (June, July, August) as a result of last year's dry season. This is especially marked in the case of the uncultivated plot, but there will now be a marked increase for some months to come. The following figures have been obtained, and are well worth noting, with regard to the copra produced:—

Picking	Break	Copra produced	Nuts required to make a candy (560lb.) of copra
March and April ...	413 nuts ...	158lb. ...	1,463
May ...	488 nuts ...	200lb. ...	1,366
June ...	598 nuts ...	234lb. ...	1,431

§ This was an excellent number, and contained much matter, as the above, and two articles on "Rubber in Malaya," of prime importance to tropical traders and planters.

* The second edition of which is being pushed on with all

† See TROPICAL LIFE, February, 1910, pp. 37.

used and manufactured by the natives. The beans are usually milled in a crude way and mixed with peanuts, and the product is sold to natives in the shape of small cakes. The business is largely in the hands of Chinese. Nearly all of the present imported supplies come from the Dutch and the British East Indies in about equal proportions. The local or native supply comes from all over the archipelago, though Ilocos Norte and the Albay Peninsula and some districts of Northern Mindanao seem to make more of a speciality of the crop than most portions of the islands. Hardly a garden in any of the larger cities, however, is without its quota of cacao trees. There are several good-sized plantations in the islands, and it is understood that these are being put into shape for modern cultivation, and it is likely that they will produce considerable quantities of the bean in a few seasons. There are many special insect and fungus pests which interfere with the cultivation of the plants, but it is thought that with modern methods decided success may be secured. The use of the product locally is likely to keep pace with production, though there may be some margin for export in the course of a few years. The beans are ground by natives or by Chinese shopmen all over the islands. Local production cannot readily be measured, but it will already probably amount to about 20,000 lb. annually, though at present, exports, all to Hong-Kong, are negligible. The present efforts towards stimulating production are in line with efforts of the Philippine Government for several years past, the Bureau of Agriculture some time ago having issued a bulletin showing improved methods of cultivation of cacao and giving an elaborate estimate of large profits in cultivation. In Indo-China considerable quantities of cacao are produced for local use, but none exported.

The Use of Dynamite in the West Indies.

CAN IT BE USED TO REGENERATE OLD-TIME BANKING POLICIES?

WE see by the *West India Committee Circular* of October 7th that Mr. Harry Vincent read a very interesting paper before the Agricultural Society of Trinidad (B.W.I.) on the subject of the experiments recently made by him with dynamite for cultivation, which, it appears, had been very successful. Some difficulty had, however, been experienced with the authorities in respect of storage, &c., and the Society therefore passed the following resolution: "In view of the undoubted benefit conferred on agriculture in the different countries where they have been used for subsoil blasting, the Agricultural Society trusts that the Government will offer and encourage every facility for the importation, storage, and use (under competent supervision) of dynamite cartridges."

In the East, Mr. W. L. P. McQueen, of Messrs. Nobels Explosives Co., whom we had the pleasure of meeting last year when we were in Glasgow, gave an interesting demonstration of the use of dynamite in rubber clearing last month on Morakelle Estate in the Kelani Valley, Ceylon, the joint property of Sir Edward Rosling and Mr. E. Gordon Brooke. A field of three-year-old rubber adjoining the railway

being selected as most suitable for the experiments, holes were drilled to a depth 2 ft. 9 in., and single charges of dynamite inserted at distances of 20 ft. by 10 ft. No earth was thrown up by the explosion, but the soil was cracked and loosened within a radius of 5 ft. to 6 ft. of each hole, and on one of the holes being subsequently opened a considerable cavity was found where the charge had been inserted.

In face of such encouraging reports, and recalling the statement that the use of dynamite when subsoiling is so safe, when properly carried out by experienced men, that a marriage ceremony can be held on the surface whilst the explosion takes place below, had we had the room in this issue to include a cartoon, which unfortunately we have not, we should have asked Mr. Jack Walker to have designed one on the following lines: We should have depicted the Chairman and Court of Directors of that old-time institution known as the Colonial Bank, sitting on its baked-up or water-logged chartered policy, into which neither enlightenment, air, or elbow-room in the shape of modern enterprise and trade expansion can penetrate to benefit those dependent on this backward soil for their sustenance. But when some dynamite (*i.e.*, modern ideas, enterprise, an extension of their charter, removal of obstinate old stumps and rocks that are preventing the Colonial Bank from amalgamating with the Royal Bank of Canada) is exploded underground, air, light, and progress can penetrate without necessarily harming the directors on the surface unless, of course, they try to prevent the cartridge from exploding, when no one can say what will happen. We have great faith in the utilization of explosives for facilitating the progress of agricultural industries, and, through that, trade generally to and from the West Indies; but whether our friends "over the border" can help us bring the Colonial Bank up to date, by using dynamite to explode their out-of-date ideas relative to modern Colonial banking, has yet to be proved.

AN historic interest attaches to a certain medicine case which has recently been returned to Burroughs Wellcome and Co. It belonged to the "Scott" Expedition, and could tell, if it could speak, what the South Pole looks like, for it has been there.

Fashioned in cubical form in plain rot-proof green canvas, upon which is inscribed the legend, "South Pole, January 17th and 18th, 1912," the case was designed according to the specifications of the late Dr. E. A. Wilson, the chief medical officer of the Expedition. It contained a sufficient supply of "Tabloid" medicaments and compressed dressings, &c., within the small bulk so essential for such an equipment, and was used by the Polar party during the long and trying ordeal of the journey to and from the South Pole.

The case was found in the tent, eleven miles from One Ton Camp, where Scott and his brave companions perished after their return from the Pole, and, in spite of the great cold and rough usage to which the case had been subjected, the contents were found to be unimpaired.



"Tropical Life" Friend.—No. 100.

MR. A. M. CHOYER,

Rubber and Coco-nut Planter, New Hebrides.

WE have always been interested in this "Friend's" career, because of what he has done, and our wish to see others "go and do likewise." When writing our book on "Coco-nuts," and especially when writing articles on running horse-breeding farms in connection with coco-nut estates, we were thinking to a considerable degree of Australia, where "Our Friend" was then planting, and her tropical planters. We do not pretend to say definitely which particular centres can or cannot run coco-nuts and horses together, but that several of them could do so we are certain. All the same it is well to remember, as the *Madras Mail* and the *Agricultural Journal* of South Africa remind us, that the first horses imported into Australia were sent from South Africa. Many of the Cape horses were taken to India as hacks and chargers by Anglo-Indian nabobs, who used, at that period, to flock to the Cape as a health resort. These horses proved able to stand the trying Indian climate much better than the English bred horse, so soon attracted the attention of the Indian Government, until about 1835, a small trade had already started, but the African farmer was not enamoured of it, and allowed the horses to deteriorate, so that the trade, said to be worth annually between one and two millions sterling, went to Australia. From letters received on the subject, the opinions even of those with long personal experience of the centres discussed do not always agree, except so far as to say that our proposition is certainly worthy of consideration and should be tried.

Mr. Choyer was interested both in Australia and Fiji, before proceeding to the New Hebrides, and both these centres seem to be badly attacked with the labour disease, due to the domination for the time being of those who think the Empire can be run on "half-time," instead of everyone

putting forward his or her most strenuous efforts to keep up in the forefront of the chief countries of the world. It was one of our articles on the labour question that brought us together. "I was very pleased to read your article *re* the labour question; your ideas are sound," "Our Friend" wrote us. "In Fiji there are now 35,000 East Indians who have been imported to work. They come for a term of five years, and have to remain in the country for another five. The idea is that as 'free' men they could still provide labour for the estates, but as a rule they settle on the land provided for them by the Government, and plant rice or tramp around as hawkers and pedlars.* In the New Hebrides, in which I am also interested, increased labour supplies are badly needed, for the agricultural industries cannot prosper, rather will they have a serious set-back, if imported labour is not forthcoming, and that very soon. On one estate in which I am interested we have only 100 boys, whereas we ought to have 300, but cannot get more, try as we will. The present system of dual control (*i.e.*, French and English) cannot but lead to disaster; what we want is direct and sole control by the Colonial Office, as in the West Indies.

"TROPICAL LIFE," "Our Friend" goes on to say, "is always looked for eagerly out here, and much appreciated, especially its articles on coco-nuts. We are also interested in rubber, but, at any rate at the moment, coco-nuts come first. Unfortunately, we only get a boat every other month, so do not receive your paper as regularly as we would like."

Our last letter from Mr. Choyer was addressed from Api, in the New Hebrides, where he has been stationed for five years, following on a similar period in Fiji, mainly in connection with rubber and coco-nuts, with vanilla culture as a subsidiary industry. For some essence he made from the latter "Our Friend" was awarded a gold medal at an exhibition held at Christchurch, New Zealand, and a silver medal at the Franco-British Exhibition in London.

In the New Hebrides "Our Friend" is again after rubber and coco-nuts, the former of which seems to be doing fairly well, but not so satisfactorily as one would like. Coco-nuts, of course, do well (Mr. Choyer is planting 33 x 30 ft.), and there are also 15,000 coffee trees and 8,000 cacao, both of which, we are told, look prosperous. Labour alone, or rather the lack of it, gives trouble. The French Government is trying to import some Chinese, but their cost is said "to be ruinous." On account of this, those who can afford it are importing cattle from New Caledonia, but many cannot afford it. The first to take up cultivation on a large scale was the "Société Française des Nouvelles Hebrides," who planted up, some twenty-five to thirty years ago, a considerable area under coco-nuts and coffee, but their efforts do not seem to have been attended with much success, though not from any fault of the soil or climate. In the absence of sufficient labour supplies coco-nuts at present seem most likely to succeed, although the other crops, rubber and cacao, would do well, given attention and the money.

* Exactly as they do in British Guiana and the West Indies, to the great advantage of this country and the Colonies, being producers of raw material and buyers of our goods.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

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5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

OCTOBER, 1913.

ECONOMIC ZOOLOGY.

"Utilization not Extermination."

The Pharisees and the Plume Traders.

IS IT JUST THAT THE SAME MAN SHOULD BE PROTECTOR, ACCUSER, AND JUDGE?

THE attitude adopted by the American Customs* towards visitors to that land of extremes is, to our mind, a great mistake. It can do naught but harm to the cause of the true bird protectionists, as it will certainly cause travellers to be prejudiced against and dislike the fanatics who believe that, because they consider their women should not wear egret or other feathers in their hats, other men and their wives and daughters must agree with them. Such methods for reforming the world are a mistake; they date back to times primeval, and have proved wrong every time. Not only do they fail to achieve the object they seek, but they cause a sharp reaction to set in, so that the majority of mankind, objecting to such uncouth and coarse methods of improving the morals of the world, fly to other extremes, and render the last stage in the condition of affairs far worse than they were at the beginning.

Not only does such uncouth and illogical treatment, meted out by an influentially powerful but numerically small minority, defeat the object sought after, but the

* "As soon as the new Tariff Bill was passed the Customs inspectors in New York, interpreting the prohibiting tariff clause literally, ripped the feather ornaments out of the hats that women passengers were wearing or had in their trunks . . . lovers of wild birds (probably those who have never seen the birds in their native haunts) are said to be delighted."—*Vide* daily papers of October 10th.

unjustness of such a high-handed procedure towards those who probably were unaware of the existence of the new law is inexcusable, especially as it seems a matter of dispute amongst those who drew up the Bill and those who have to administer it as to what the framers of the law intended. All we know for certain is that the extremist is delighted because he has stopped a legitimate trade for purely sentimental reasons, whereby many people will be seriously inconvenienced if not actually thrown out of work; and all this to satisfy a passing whim.

Regarding the unjust manner in which legislation on the question, even on this side, is being forced through on an unwilling public (99 per cent. of whom are ignorant and indifferent as to what is going on, and will remain so until, like passengers going into New York, they are roughly and rudely awakened), we would mention that the Right Hon. Sydney Buxton, whilst President of the Board of Trade on the one hand, is also Treasurer of the Royal Society of the Protection of Birds on the other. What justice or protection can the millinery trade and the bird traders, and those who hope to see bird-farms established abroad,* expect under such circumstances? Mr. Buxton, although not the Chairman of Mr. Hobhouse's Committee or Conference, seems to have been the chief inquisitor and questioner when members of the millinery trade gave evidence. So we have the peculiar anomaly of a high official who is supposed to protect and further the trade of this country acting also as a leading official of a society whose one object seems to be to stop a trade, whether that trade is carried on in a manner that the public approve of (as by using no bird that is becoming scarce, or by establishing farms to breed the birds and collecting the feathers) or not. In the same way the late Lord Avebury, the Duke of Bedford and others were allowed to sit in judgment on the trade although apparently intensely prejudiced against it, so that no sympathetic hand was held out to trade witnesses, and irrefutable statements of importance to the trade, since they did not interest the members of the Committee, were not given the prominence in the report that they deserve. But even the report of the Avebury Commission, since it was published, was fairer than the subsequent Conferences at which Mr. Montague and the President of the Board of Trade took such prominent parts, as it seems that the evidence, being given in confidence, cannot be published. The trade know only too well the extraordinary "yarns" that their detractors can spin, and such methods are not conducive to inspiring confidence in measures based on evidence so protected from criticism.

On the evidence obtained by such means, however, there has been built up and brought forward the Hobhouse Bill, No. 301, supported by Mr. Sydney Buxton, to prohibit the importation of the plumage and skins of wild birds, except ostriches (a farmed bird) and eider ducks, which for the most part are carefully watched and preserved. Those who, like ourselves, have been for some months advocating the establishment of pheasant, egret and other bird-farms in territories under the English flag and elsewhere,

* See previous issues of TROPICAL LIFE on egret, pheasant, and other bird-farming enterprises.

as others are encouraging in French and German territories, will have no other prospect than that the produce from such farms will be shut out of England and forced to the Continent in just the same manner as with wild birds shot in the woods. We are even treated worse, for the last of the rare birds may still be killed for museums and for fly-fishing bait. This reminds us of the *London Morning Post's* concluding remarks in their lengthy review of our book on the question,* when they said: "Surely the climax of absurdity is reached when we find an exception so deficient in humanitarianism, in chivalry, and in logic, as that which permits the bringing in of feathers for the more deadly equipment of a man's fishing tackle, while refusing to allow their being used for decorative purposes upon the headgear worn by his wife."

The *Morning Post* is right, and Mr. Buxton and his colleagues are wrong; there is far more possibility of the fishing trade and the museum trade exterminating rare and beautiful birds than there ever has been or ever will be of the millinery-bird trader even causing the birds that they use becoming really scarce. If it is desirable to prevent women wearing plumage, let us have more truthful and just reasons advanced, and less rough and coarse methods adopted to induce the sane and nature-loving majority to agree to abolish the objectionable hat-gear, that is, if it can be proved to be objectionable.

Nitrate of Soda and Increased Rubber Yields.

IN our issue of March, 1910, p. 53, we called attention to the increased flow of latex and to the larger output of dry rubber obtained in Hawaii by the application of small doses of nitrate of soda to Ceará trees (*Manihot glaziovii*). These notes attracted so much attention at the time, that we added to them, and printed off 5,000 copies of a pamphlet, entitled "The Question of Manuring Rubber," for distribution at the London Rubber Exhibition of 1911, and afterwards. This pamphlet is, we believe, practically out of print, but the advantages of the application of nitrate of soda have not been lost sight of, as we know by communications from, or conversations with friends interested in the matter.

We were reminded of this the other day by the receipt of the *Planters' Chronicle*, of Bangalore, South India, of August 9th. This paper is recognized as the official organ of the United Planters' Association of Southern India, in which our old friend, Mr. Rudolph Anstead, plays a leading part as Scientific Officer.† In this paper, on p. 384, we are given further data as to the effect of nitrate of soda and nitrate of potash (saltpetre) on the flow of Ceará latex.

The information as regards the effect of nitrate of potash on the trees and their latex as compared with nitrate of soda is worth noting, but some idea should have been worked out as to the comparative benefits,

* "Aigrettes and Birdskins"—the truth about their collection and export. With a foreword by Sir J. D. Rees, K.C.I.E., C.V.O., M.P., 4to. 138 pp. Price, cloth cover, 5s. (supply limited), paper cover, 2s. post free.

† Mr. Anstead was also in the West Indies—see his sketch as "Our Friend," *TROPICAL LIFE*, May, 1911, p. 90; also many references to him and his work in our "Soil and Plant Sanitation." 11s. post free.

price for price, since saltpetre (nitrate of potash) was quoted in London, on September 2nd, at £20 10s. a ton for Bengal to arrive, as buyers' valuation, whilst sellers were asking £21 5s.; against this the same list quoted nitrate of soda as costing only £11 for prompt shipment.

In 1911, the *Planters' Chronicle* tells us, an experiment was begun in Coorg to test the effect of an application of nitrate of soda upon the flow of latex in the Ceará rubber tree. This experiment was suggested by some favourable results obtained in Hawaii and published in one of the Agricultural Experiment Station bulletins of that place.

Preliminary experiments with a few selected trees showed that an increased yield of rubber was obtained by applying nitrate of soda, and the Hawaiian results were confirmed to a certain extent. The results obtained in Coorg seemed to warrant further trials on a larger scale, and during 1912 these were made both with nitrate of soda and nitrate of potash (saltpetre) on plots of fifty trees each.

The system of tapping was the same throughout, full herring-bone with a V channel, the cuts 12 in. apart, tapped every day with the exception of Sundays. There was a very light rainfall during the period of experiment and the plots were watered to wash the manures in. In a table of yields, which covers three or four pages of our contemporary, but which, unfortunately, we have no room to show here, figures showing the weight of latex in ounces are included.‡ The manures were applied to all the plots on December 4th, 1912, and the first five tappings shown in the tables were made before the manures were applied in order to find the relative yield of the plots. The experiment falls into two classes: one a test with nitrate of soda and nitrate of potash on an area of rubber *known to yield badly*; the results on this area are given in Table I, plots 1 to 5. The second experiment was a test of nitrate of soda on an area of rubber *known to yield well*; the results of this experiment are given in Table II, plots 6 to 8.

In order to correlate these results and eliminate as far as possible the initial differences between the yield of the different plots which existed before the manures were applied, the percentage of increase or decrease above or below the control plot has been calculated for each group of five tappings. These figures will be found in Table III in the pages of our contemporary.

It will be seen from these tables that in the first experiment with rubber known to yield badly (plots 1 to 5) both the application of half a pound of nitrate of soda per tree and one pound of nitrate of potash per tree resulted in an increased flow of latex and yield of rubber, and that this increase is above the 10 per cent. which, according to Hall, represents the experimental error in field experiments. This result is very satisfactory in that it again confirms the Hawaiian results and repeats those obtained last year in Coorg, as far as nitrate of soda is concerned.

In the second experiment with rubber known to yield well, the addition of half a pound of nitrate of soda per tree made practically no difference to the yield of latex, showing that in this area the conditions

‡ We must refer readers to the *Planters' Chronicle* for the tables showing results, as we have not space to include them here.

could not be bettered in this way, and that as good a yield as possible is already being obtained.

The results obtained with nitrate of potash are of great interest because this fertilizer contains two plant foods, potash and nitrate, while nitrate of soda contains only one. It gave a slightly better result, though whether this was due to the potash, or to the fact that weight for weight it contains less nitrate than the soda, there is insufficient data to decide, but in either case there is no doubt that the amounts of potash and nitrogen employed could have been supplied more cheaply if a mixture of nitrate of soda and sulphate of potash had been used in the place of nitrate of potash. In addition, the relative effects of each of these ingredients could have been separately determined.

The Preparation of Raw Rubber.

WHICH IS THE BEST METHOD?

QUERY.—Can the present method of preparing plantation rubber in the East be improved so as to reduce the cost and enable the resultant product to be turned out to sell more on a parity with, if not above the price realized by Brazilian “*pelles*”?

Would it not be better for planters in the East to consider the above instead of continuing the controversy now raging, and raging, too, somewhat bitterly at times,* and to no one's advantage, between the financiers and supporters of the plantation producers in the East, and the indigenous rubber exporters in the West, as to the relative merits of the rubber turned out by each, and which side of the world deserves the reputation of placing upon the market the most useful and reliable rubber, *i.e.*, the raw material which, when made up, lasts the longest, and is able to stand the greatest amount of wear and tear, even under exceptionally trying conditions. If the manufacturers prefer to consider the Brazilian rubber, with its 10 per cent. to 20 per cent. of moisture, better than the Eastern, which contains hardly any water at all, why not send rubber to market to suit the tastes of those who have to buy it, instead of following the ideas of those who sell it?

Why complain if, by smoke-curing the rubber and exporting it in cubes or balls containing the above percentage of moisture, the buyers will give you 3s. 4d. per lb. for it, water and all, instead of only 2s., as the top price for almost water-free rubber? Because the West spends so much money in financing the *seringueros* who collect the rubber, and because the East claims that they can turn out their rubber so much cheaper than the West, neither of these facts or statements are any excuse for the East continuing to send rubber that only sells at 2s. per lb. or under, whilst the main portion of the Brazilian output sells

at either 3s. 4d. per lb. for hard fine, or 3s. 2d. for soft.†

Whilst paying due deference to those on the spot who produce the rubber, and whose money has been, and is being risked in preparing the produce for sale, we have all along suggested that it pays better, and will always pay better unless circumstances alter vastly, to prepare plantation rubber in bulk,‡ smoke coagulating the latex to start with, and then subjecting it to pressure, either by placing the crêpe or blanket sheeting under pressure and leaving it there for a week or two previous to shipment,§ or by rolling it under tension, whilst still moist, on to a spindle into an egg-shaped ball, like yarn, and then placing that under pressure, preference being given to the latter (rolling into balls) for these reasons.

Old time rubber-folk contend that the rubber shrinks considerably when wound round whilst somewhat moist, as described above, or as laid on, without tension even, by the Brazilian curer over uricuri nuts, and that this pressure in time becomes considerable, keeping the rubber good and thereby improving its quality. This water- and air-proof covering is claimed to be the cause of Brazilian balls (*pelles*) keeping so well, and smoke-curing the latex, instead of adding acetic and other acid to it, is the reason (together with the greater age of the trees) why the Brazilian rubber is preferred (in the ratio of 3s. 4d. to 2s. per lb. or less) to Eastern Plantation. Smoke-curing the latex in bulk, therefore, and subjecting the rubber to pressure would, we claim, improve the quality of Eastern Plantation, as it has done Brazilian “hard fine.” Up to now the amber or colourless, practically pure sheet, from the East has enjoyed a premium, being a new, hitherto unknown and fancy article, creating new channels of demand. This demand, however, is limited, and the supply having overtaken and left it far behind, we feel that the East must follow in the train of the West, and, first ascertaining what the manufacturers, *i.e.*, the buyers, really want—and we maintain that is Brazilian “*pelles*”—the East should see that they send their rubber to market with an average water content of 15 per cent., in blocked or, better still, in rolled balls, as described.

Apart from any other drawbacks, sheet, and especially crêped, rubber must deteriorate seriously when laid up awaiting sales or stored away in the manufacturer's warehouse until wanted. Those who

tion people, without making any show by way of retaliation. Plantation people, not unnaturally, have gone far out of their way in their efforts to cry up cultivated rubber and discredit the collected article, but at last the worm has turned. The raw industry finds itself near the danger zone, and the fight for existence begins.”

† In an article sent to our old friends, Messrs. Charles Grenier and Son, of Kuala Lumpur, for the annual or current issue of their *Rubber News*, we go fully into this matter, *viz.*, of sellers—*i.e.*, the producers, sending what they have to dispose of, instead of what the manufacturers, *i.e.*, the buyers, show they prefer. We also suggest a preventive (infallible, of course) for the dreaded disease of over-production, and show how and why, in the near future, plantation rubber will be turned out in form and quality similar to Brazilian *pelles*, at a minimum of cost, since it will not be touched by hand (once the latex has been poured into the smoke-coagulating tank) from start to finish.

‡ See “Notes on Soil and Plant Sanitation on Cacao and Rubber Estates,” p. 551, *re* coagulating in bulk, and p. 560 on the *pros and cons* of blocking rubber, TROPICAL LIFE Publishing Department. Price 11s., post free.

§ See TROPICAL LIFE, May, 1907, p. 69, and (the same article reprinted in Portuguese) in July, 1907, p. 103, *re* “Press Blocking Rubber.”

* “In an interesting article called ‘The Fight Begins,’ published in *Grenier's Rubber News*,” as the *Brazilian Review* points out, “the writer discusses the rival claims and merits of Middle East and Brazilian rubber, and also the probability of a bitter and venomous fight between the two interests. He starts by saying that it could hardly be expected at any time that Brazilian rubber interests, the great rival, would lie down quietly without a struggle and allow plantation interests to stamp them out of existence. But (the article proceeds) it is only now that the struggle between wild and plantation rubber interests has at last begun. The fight is destined to be bitter and possibly exceedingly venomous; of the latter there have been signs already. The wild interests recognize now that they have stood by for long and allowed their collected product to be abused, and its inferiority made the most of by the rival planta-

have looked into the matter recommend that the rubber, when about to be stored, should be blocked after being washed, as doing so reduces to a minimum the area exposed to the oxidizing, and therefore deteriorating effects of the air. Comparative analyses, it is claimed, showed, with Lewa Manihot rubber, that the percentage of insoluble matter had increased in six months from 3 to 27 per cent. Blocking the rubber, it is believed, would show a great improvement in regard to this heavy loss.*

We do not pretend to be infallible, but are, on the contrary, always ready to own at once that, like everyone else, we are liable to make serious mistakes; at the same time we have had thirty years' close personal connection with the production, preparation and shipment of tropical produce, to say nothing of the knowledge obtained from those who went before us, and no article, except cacao, has received such careful attention from us as the question of preparing and shipping rubber in such a form as will cost the least, please the most, and cause least waste from perishing. We maintain that, to secure these, the latex should be treated with smoke containing the necessary antiseptics, that it should be wound off under tension, that it can contain 10 per cent. of moisture, and, above all, that the bulk of it should not be shipped in sheet form, but in cubes or "hams" (*pelles*).

Before leaving this matter altogether, and since Messrs. David Bridge and Co., Ltd., have recently sent a vulcanizing plant to the Federated Malay States, it may be interesting to reproduce the following from our issue of September, 1907, being a portion of Part vi of "Castilla Planting and Preparation," by the late Dr. Pehr Olsson-Seffer, who at that time was in charge of La Zacualpa Botanical Station, Mexico:—

"The addition of finely pulverized sulphur by a process corresponding to that of vulcanization suggested itself in the early stages of my experiments with *Castilloa* latex in the laboratory at La Zacualpa. This sulphurizing the latex is, of course, easily feasible, but beyond its preserving action on the crude rubber there is very little in it to recommend it to the planter. . . . My series of experiments on sulphurizing latex and preparing rubber from material treated thus, consisted of sixty-three different experiments, each varying from the others in some more or less important detail. I made good and bad samples from the sulphurized latex. In most cases there was no development of bacteria in the rubber, even though the samples were exposed in the culture jars to an atmosphere full of spores of mould, and decaying latex was poured on the rubber. Inoculation of bacteria cultures made in different forms occurring in 'tacky' rubber were tried, but failed to develop on samples where a thorough admixture of latex and sulphur has been accomplished. The preserving power of sulphur mixed into the latex seems undoubted.

"I have tried many various methods of smoking *Castilloa* rubber, and of coagulating by means of smoke. The most successful one is, I believe, the following: The fumes of burning sulphur were pressed

into the latex for varying periods, and it was found that this assisted the coagulation considerably. I then mixed fumes of burning sulphur with the smoke of creosoted wood, pressed this mixture through a cooling apparatus to slightly bring down the temperature, and thoroughly fumigated the latex. This coagulated quickly and gave a greyish rubber, perfectly transparent, with a high degree of tensile strength. It had not deteriorated six months after the experiments were carried out."

Coco-nuts and Rubber in Malaya.

ACCORDING to official figures the area under coco-nuts in the Federated Malay States in 1912 was 157,600 acres, being an increase of 14,826 acres over that of 1911. The quantity of copra exported during the last five years was as follows: 1908, 71,981 piculs; 1909, 104,469; 1910, 125,770; 1911, 135,064; 1912, 129,531 (picul = 133½ lb., so 3 piculs = 400 lb.).

Compared with the above the progress in the cultivation of rubber during the last two years is illustrated by the following statistics:—

	1911.	1912.
Number of estates ...	700	703
Total acreage ...	766,793	794,545
Acreage planted to		
December 31st ...	352,974	399,197
Rubber exported lb.	19,695,330	34,732,415
Value of rubber exported ... dols.	39,914,672	63,124,342
Price of rubber per lb.	4s. 6d. to 8s. 0½d.	4s. 1d. to 5s. 8½d.

It is estimated that the total area of land now planted with rubber in Malaya (*i.e.*, the Federated Malay States, the Unfederated States and the Straits Settlements) is 621,621 acres, of which only 165,566 were producing rubber at the end of 1912. The average yield per acre works out at over 250 lb. The yield from the whole area now under cultivation should in six or seven years' time (therefore about 1920) amount to 88,000 tons at a conservative estimate. This is worth noting, as only the other day a leading expert was telling us that the Brazilian Defence Organization were talking of 300,000 tons from the East by 1919.

Those who believe in our methods for running successful coco-nut or rubber estates will be glad to hear that one of the modern concerns, *viz.*, The Straits Plantations, Ltd., has been busy laying pipes to distribute water to all the coolie lines, bungalows, &c., whilst new copra-drying kilns have been erected and are said to be working satisfactorily. Many other buildings have been put up and brought into use, whilst last, but not least, in these days of labour troubles, a trolley-way connecting the copra-drying house with the wharf has been laid down. Other estates, which have not already done so, will be well advised to follow the example of this (7 per cent.) dividend paying concern. Our readers may be further interested to know that this company turned out rather over 750 tons of copra, costing under £15 a ton (£14 8s. 3d. to be exact) to produce, which sold, after deducting freight and charges, at £22 16s. 2d. per ton, thereby showing a profit of over 50 per cent. on the cost price, without, however (we take it), allowing for interest on capital, depreciation, &c.

* See M. Schellmann in *Le Caoutchouc*, of Paris, in *TROPICAL LIFE* for February, 1909, p. 23.

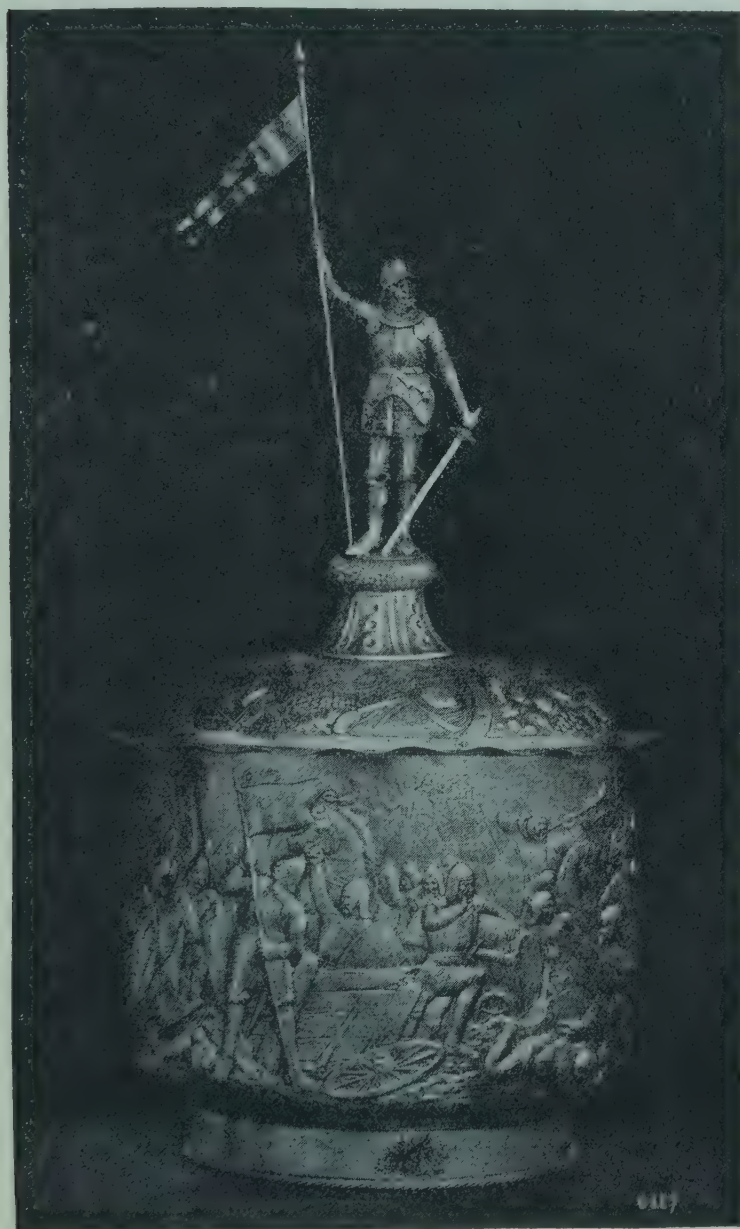
Prizes for Economic Products at the Coming (1914) Tropical Agricultural Exhibition.

THE KALISYNDIKAT (BERLIN) TO GIVE TWO SILVER TROPHIES.

BESIDES the seven gold medals to be offered for competition by TROPICAL LIFE at the 1914 Rubber and Tropical Exhibition (see Advert., p. xxxiii), we have much pleasure in calling attention to the two silver trophies to be offered by our friends, the Potash Syndicate of Berlin, one for the best sample of cotton in the Exhibition, and one for the second best.

We have much pleasure in reproducing photographs of the trophies, showing them to be worth competing for, and in view of the continued good demand for the

muriate of potash, or (b) with the aid of a commercial fertilizer containing a guarantee of not less than 5 per cent. potash. (2) One sample of about 1 cwt. ginned cotton and one sample of about 10 lb. cotton in its natural state shall be submitted. (3) It is recommended that similar samples be forwarded from like land cultivated by the competitor, but of cotton grown without potash. The submitting of such sample, however, though strongly recommended, will not be insisted upon. (4) The sample shall be representative of the crop, and shall be accompanied by particulars in writing as to (a) The total yield per acre, ginned and unginned; (b) method of cultivation and fertilization; (c) type of soil; (d) average rainfall during growing period. (5) By entering, each competitor agrees that at least 10 lb. may be taken from each sample for the purpose of handing samples to judges: (a) manufacturers, and (b) chemists. (6) All cotton must be removed within three days after the close of the Exhibition by the exhibitor or his representative. (7)



Trophy to be offered as First Prize by the Potash Syndicate (Kalisyndikat), Berlin, for the best sample of cotton at the coming Cotton, Fibres, &c., Exhibition, to be held in London next June (1914).

finer qualities of cotton, we hope many of our cotton-growing readers will be exhibiting and enter up their names for this competition.

The competition is open to all cotton-growers in all countries, the following conditions to be observed:—

(1) The crop from which the sample is submitted shall have been grown either (a) with the aid of a fertilizer containing potash in one or more of the following forms: Kainit, sulphate of potash, or



Trophy to be offered by the Potash Syndicate, Berlin, as Second Prize, for the best sample of cotton at the 1914 Exhibition.

No entrance fee will be charged. (8) The decision of the judges is final. Entries close June 1st, 1914, and must be made by registered post, legibly written or typed on the forms to be obtained from Mr. Manders.

All samples must be forwarded carriage paid, and must reach the Royal Agricultural Hall, London, N., not later than June 10th, 1914. Entries should be lodged with The Awards Committee, c/o A. Staines Manders, Exhibition Offices, 75, Chancery Lane, London, W.C.

We have also to report that the Publishers and Editorial Department of the *Gummi-Zeitung*, Berlin, are offering a silver vase, value £25, for the best design for laying out a factory for the manufacture of rubber goods.

Cotton.

THE following were the prices for Cotton in London on October 9th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.		Good, 1912.		Compare	Good, 1911.		per lb.
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.		d.	d.	
Surat kinds*	5 $\frac{1}{8}$	to 6 $\frac{1}{8}$	6 $\frac{3}{8}$	to 6 $\frac{5}{8}$	6 $\frac{7}{8}$	to 6 $\frac{1}{2}$	—	—	5 $\frac{5}{8}$	to 5 $\frac{1}{2}$		5 $\frac{3}{8}$	to 5 $\frac{5}{8}$	—
Madras	6 $\frac{5}{8}$	to 6 $\frac{3}{4}$	6 $\frac{1}{8}$	to 7	—	—	—	—	5 $\frac{1}{8}$	to 6 $\frac{1}{8}$		5 $\frac{1}{2}$	to 5 $\frac{1}{8}$	—
Bengal	—	—	5 $\frac{5}{8}$	—	5 $\frac{7}{8}$	—	6	—	5 $\frac{1}{4}$	—		4 $\frac{3}{4}$	—	—
Assam	—	—	5 $\frac{7}{8}$	—	6 $\frac{1}{4}$	—	6 $\frac{1}{2}$	—	5 $\frac{3}{4}$	—		5	—	—
China	—	—	6	—	6 $\frac{5}{8}$	—	6 $\frac{9}{16}$	—	5 $\frac{5}{8}$	—		5 $\frac{5}{8}$	—	—
West Indian	7	—	7 $\frac{1}{2}$	—	8	—	8 $\frac{1}{4}$	—	7 $\frac{1}{4}$	—		7 $\frac{1}{2}$	—	—
Sea Island	12 $\frac{1}{2}$	—	15	—	18 $\frac{1}{2}$	—	22	—	14 $\frac{1}{2}$	—		14	—	—
West African	6 $\frac{3}{4}$	—	7 $\frac{5}{8}$	—	7 $\frac{1}{2}$	—	—	—	6	—		5 $\frac{1}{2}$	—	—
East	7 $\frac{7}{8}$	—	8 $\frac{1}{4}$	—	10	—	—	—	7 $\frac{3}{8}$	—		6 $\frac{3}{8}$	—	—

* Liverpool quotations.

The opinion has been gradually gaining ground that the recent disastrous reports as to the growing American crop are greatly exaggerated, and that the reduction in the yield may not be so great as expected. On this, the week's (ending October 9th) prices for Deliveries are 29 to 32 $\frac{1}{2}$ points lower. This has reacted upon East Indian Cotton and made it more than ever difficult of sale. Silver is quoted 28 $\frac{1}{8}$ d. per oz.

The import into Liverpool this week amounts to 70,154 bales, since September 1st 267,477, same week last year 69,942, last year's total 290,332 bales. The estimated Sales amount to 59,000 bales, including "called." Middling American is quoted at 7·65d. per lb., last year 6·26d., 1911, 5·41d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight	1,866,000	1,723,000	1,886,000	bales
Exports from United States since September 1st—				
To Great Britain	396,000	416,000	560,000	—
To Continent, &c.	609,000	452,000	599,000	—
Total crop	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	October 9th.	Same time 1912.	Same time 1911.	
October	7·20 $\frac{1}{2}$	6·04 $\frac{1}{2}$	5·13	per lb.
Oct.—Nov.	7·08 $\frac{1}{2}$	6·01	5·09	—
Nov.—Dec.	7·00 $\frac{1}{2}$	5·95	5·04 $\frac{1}{2}$	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

THE market at the beginning of October was firm and dearer and the good supplies of all descriptions which have been offered at auction were in generally good request, Central American kinds showing an advance of 1s. to 2s. per cwt. Dumont Santos was rather slow, but firm prices were realized. There has been more business doing privately, with a good export inquiry. In consequence of continued adverse crop reports the market for "futures" has shown a considerable advance, and though closing values are a little below the best, the latest price of March Santos is 3s. 7 $\frac{1}{2}$ d. above last week's quotation :—

	To-day	Sept. 25th, 1913
London	Santos, Mar. del. ... 50s. 1 $\frac{1}{2}$ d.	46s. 6d.
New York	No. 7 Rio ,, ... 10.33 cents	9.72 cents
Hamburg	Santos ,, ... 56 $\frac{1}{2}$ pf.	52 $\frac{1}{2}$ pf.
Havre	Santos ,, ... 69 francs	63 $\frac{3}{4}$ francs

The receipts at Rio and Santos from July 1st to October 1st, 1913, were 5,295,000 bags, against 4,310,000 bags and 5,200,000 bags in the two previous years respectively.

Sales include the following, viz. :—

Mysore.—77s. for middling.

Coorg.—80s. 6d. to 81s. 6d. for good middling.

Travancore.—70s. for smalls, 76s. for middling, 79s. 6d. for bold.

Ceylon.—At 73s. for Liberian.

Java.—At 66s. for fine ordinary greenish, 83s. for bold yellowish Liberian.

Jamaica.—At 55s. to 57s. for ordinary, 80s. for middling.

Costa Rica.—At 70s. to 75s. for smalls, 73s. 6d. to 82s. 6d. for middling to good middling, 80s. to 85s. 6d. for bold.

Guatemala.—At 61s. to 65s. for good to fine ordinary, 78s. for good middling, 82s. for bold.

Salvador.—At 63s. 6d. to 65s. for fine ordinary bold foxy palish, 68s. 6d. to 78s. for low middling to good middling, 75s. 6d. to 77s. for greyish bold.

Nicaragua.—At 53s. to 57s. for ordinary to good ordinary dull foxy, 70s. 6d. to 83s. 6d. for middling to good middling, 80s. to 94s. 6d. for middling to fine bold.

Vera Paz.—At 67s. to 76s. 6d. for smalls, 75s. to 86s. for middling to good middling bold, 94s. 6d. to 104s. 6d. for Maragogipe.

Mexican.—At 53s. to 59s. for ordinary to good ordinary greyish and greenish.

Colombian, &c.—At 66s. to 72s. 6d. for smalls, 64s. 6d. to 80s. for fine ordinary to good middling, 76s. 6d. to 87s. for fair to fine bold.

Dumont Santos.—Washed at 63s. 6d. to 65s. 6d. for smalls, 66s. to 68s. for medium; unwashed, 57s. for smalls, 69s. for bold.

Sugar.

MESSRS. C. CZARNIKOW, LTD.,* when pointing out, at the close of September, the uncertainties of Cuban supplies to Europe, wrote that they did not expect the market to decline still further from 3·67 to 3·48 = 9s. 9d. c.i.f. New York for sugar on the way. As regards prices, much will depend on the Cuban crop itself; with normal weather henceforth the backwardness caused by drought in July/August is hardly likely to disappear, only exceptional weather might give us a repetition of last year's crop.

In Europe we have been having ideal weather, which no doubt has considerably benefited the crop, but last year it did not stand still either during the corresponding period; factories do not forget this, though speculators may. Reports still vary, even from Hungary. Those from France are the least satisfactory; there, so far, we have deficiency in sowings, in weights, and in saccharine.

At the beginning of October the American market showed further weakness, and the quotation for 96 per cent. Centrifugals receded from 3·67 to 3·54 cents = 9s. 9d. c.i.f. New York for Cubas, or 7s. 3d. f.o.b. Hamburg for 88 per cent. net Beet.

In the United Kingdom only a small business has been transacted in refining grades of cane sugar. Grocery crystallized sells very slowly at unchanged values. From cane-producing countries there is not much news. In Cuba there is one factory at work against one last year. The Cape mail reports that rain is badly wanted in Natal. From Barbados favourable showers were reported by letters dated September 17th and by cable received later, but more rain is wanted.

Transactions include about 3,000 bags, say, crystallized Trinidad, low yellow to low middling ditto, 14s. 3d. to 14s. 6d. duty paid; fine yellow 15s. 3d. Crystallized St. Lucia, good yellow and pale, 15s. to 15s. 3d.; whilst syrups (1,300 bags) sold, low heavy yellow, 11s.; middling soft yellow, 11s. 6d.; good middling soft yellow, 12s. 6d. Crystallized Antigua, good yellow, 14s. 10½d. 1,000 pockets bright brown San Salvador syrups were bought in at 14s. duty paid, but have since been sold on private terms. Up at Liverpool 1,288 bags Peruvian syrups sold at 8s. 10½d. quay, telquel.

The India-rubber Market.

UP at Liverpool the Pará market has been dull and declining all the week, and the only sales reported there are 10 tons of hard fine spot at 3s. 3½d.; values at the close being hard fine spot, 3s. 4d.; October-November, 3s. 2d.; and November-December, 3s. per lb. There has been a moderate inquiry for medium Brazilian grades, with sales of Maniçoba made at 1s. 1d. to 1s. 5d., and Ceará scrap at 1s. 2d. to 1s. 3d. per lb. The African market has been steady, and the sales

reported amount to 20 tons, including Rio Nunez niggers, 2s. 1d.; Lahou cake, 1s. 3½d.; Gambia niggers, 1s. 3½d.; Gaboon ball, 1s. 4d.; selected Gold and/or Ivory Coast lump, 11½d. to 1s.; third Gold Coast lump, 11d.; Niger flake, 9¼d.; and Gold Coast paste, 9d. to 9½d. per lb.

London reports generally show that the Pará market has been displaying a firm undertone, and sellers have been more or less reserved, prices closing at a slight recovery on the week for the forward positions. Business has been restricted, hard fine on the spot closing 3s. 4d. nominal value; October delivery 3s. 3d. sellers; October-November 3s. 1d. value; and December-January 3s. Soft fine also is more or less nominal at 2s. 11½d. for October delivery; business was done earlier in the week at 2s. 11d. Negroheads dull. Manaos scrappy quoted 2s. sellers, Cametas 1s. 6½d. value, and Islands 1s. 5d. Bolivian: Fine on the spot quoted 3s. 3½d. nominal. Peruvian: Fine value on the spot 3s. 2½d. Caucho Ball: Business has been done on the spot and near at 2s. 0¼d. to 1s. 11½d., and distant positions at 1s. 11d.

Writing on October 9th, Messrs. S. Figgis and Co. reported that there was more competition at the auctions on October 7th and 8th, and prices were very little below previous sales which, privately, had been considerable.

Prices realized at the auctions, which included 636 tons Crêpe, 90 tons Smoked Sheet, 33 tons Sheet, and 31 tons Scrap, ran as follows:—

Malayan Plantation (613 tons, all sold).—Crêpe, fair to fine pale, dull to good palish, 2s. 1d. to 2s. 1½d.; light brown and grey, part streaky, 1s. 11½d. to 2s. 1d.; fair to good clean brown, 1s. 9¾d. to 2s. 0¼d.; dark and specky brown (one lot 2s. 0¼d.), 1s. 6¾d. to 1s. 10¾d.; dark and black, part pressed, 1s. 6½d. to 1s. 9½d.; dark and black, inferior, 1s. 2¾d. to 1s. 6d.; dark to good smoked, 1s. 8½d. to 2s. 0¾d.; cured by "Byrne" process, good, 2s. 2d. Sheets, fair to very fine smoked (Highland, 2s. 9¼d. to 2s. 10¼d.), 2s. 4d. to 2s. 6d.; damp, mouldy, and part smoked, 2s. to 2s. 4½d.; fair to fine unsmoked, 2s. 2d. to 2s. 3¼d.; damp, mouldy, and stuck, 1s. 10¾d. to 2s. 2d. Block, fine pale Lanadron, 2s. 1¾d. to 2s. 2d. Scrap and Virgin, fair to good, 1s. 3d. to 1s. 4½d.; mixed and inferior, 7¼d. to 1s. 2½d. Rambong, Crêpe, 1s. 9½d. to 1s. 10¾d.; scrap and block, 1s. 6d. Ceará, block, 1s. 9¾d.

Ceylon (177 tons, all sold).—Crêpe, thick dull to fine, 2s. 1d. to 2s. 2¼d.; fair to fine pale, dull to good palish, 2s. 1d. to 2s. 1½d.; light brown and grey, part streaky, 1s. 11¾d. to 2s. 0¾d.; fair to good clean brown, 1s. 9¾d. to 2s. 0¼d.; dark and specky brown, 1s. 7½d. to 1s. 10½d.; dark and black, part pressed, 1s. 6½d. to 1s. 9½d.; dark to good smoked, 1s. 9d. to 2s. 1½d. Sheets, fair to good smoked, 2s. 4d. to 2s. 5¾d. Sheets and Biscuits, fair to good unsmoked (very fine, 2s. 4¾d.), 2s. 2d. to 2s. 3½d.; damp, mouldy, and stuck, 2s. to 2s. 2d. Scrap and Cuttings, fair to fine, 1s. 3d. to 1s. 5¼d.; mixed and inferior, 6d. to 1s. 1¾d.

Twenty-eight cases Manihot Crêpe sold, part pressed, 1s. 2½d. to 1s. 6d.

Twelve bags pressed Mozambique sold; Reddish Ball realized 1s. 6d. to 1s. 7d.

As a supplement to their weekly circular, No. 344,

* The business of C. Czarnikow was transferred on October 1st to a private company, registered under the name of C. Czarnikow, Ltd., with a paid-up capital of £500,000. Mr. C. Fred Worters and Mr. R. D. Hughes have authority to sign on behalf of the company.

dated October 8th, Messrs. Zorn and Leigh-Hunt published an estimate of the probable output of plantation rubber for some years to come, which shows every sign of having had much time and care devoted to its preparation, and we believe the compilers when they say "they have checked their figures in every way possible. It is noteworthy," they add, "that the results obtained in our analysis practically coincide with the figures given by Mr. H. T. Brice. The results also agree to a remarkable extent with another entirely independent investigator. Actual figures are given for 1912, and practically actual ones for 1913. The column 'Rest' refers to inferior grades of wild rubber (Congo, &c.) which have already become unsaleable except at a severe loss. These grades are likely to drop out with startling suddenness, but to be on the safe side we have allowed for a drop of only 12,000 tons in 1914. If the price of plantation rubber, on the other hand, remains for a time around 2s. per lb., the world's output, which we have estimated for 1914 at 124,000 tons, is likely to be so sharply reduced . . . that an actual shortage may easily be experienced before the end of the twelve months, as is shown by the figures given below. At the same time the demand for tyres continues to increase."*

Pará rubber statistics for the month of September (in tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará	2,440	440 =	2,880 agst.	2,620	2,640	1,980
Shipments to Europe	1,120	220 =	1,340	1,260	1,030	880
„ „ America	1,120	180 =	1,300	1,260	1,540	1,030

Crop statistics, June 30th, 1913, to September 30th, 1913 (3 months):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.	1909.
Pará { 1913	5,270	1,330	6,600	6,460	5,650	6,180	5,290
Receipts { 1912	5,440	1,020					
„ Shipts. Europe	2,400	790	3,190	3,790	3,360	3,060	2,890
„ „ America	2,630	670	3,300	3,970	3,470	2,750	2,140

* 83,055 motor-cars and cycles were registered in England up to September 29th this year, against 67,831 vehicles in 1912, an increase of 15,234, or 27½ per cent.

Coco-nut Products, &c.

OCTOBER opened, according to Messrs. Mordaunt Bros., with coco-nut oil, both Ceylon and Cochin, quiet, and by October 11th prices had dropped 20s. per ton, closing steady at 46s. for Ceylon, and 51s. Cochin c.i.f. terms. Palm kernel oil, on the other hand, had been dealt in largely at 44s. 9d. to 45s. 3d. f.o.b. Hamburg, closing as quoted below, against 44s. to 44s. 6d. paid in London for pressed oil. Palm oil started with a good demand at full rates, and has continued unchanged, with a slight tendency for rates to go lower.

Prices generally on October 11th ran as follows:—

Palm oil (Liverpool):		1913	1912	1911
Per cwt.				
Lagos	34s. to 34s. 3d.	33s. 9d. to 34s.	33s. 3d.	
Benin	29s. 3d. to 29s. 6d.	28s. 6d. to 28s. 9d.	30s. 3d.	
Congo	28s. 6d. to 28s. 9d.	27s. to 28s.	28s. 3d.	
Bleached	33s. 6d. to 34s. 3d.	33s. 6d. to 34s.	34s. 3d.	
Clarified	30s. 6d. to 31s. 3d.	29s. 9d. to 30s. 6d.	31s. 3d.	
Palm kernel oil	44s. 9d.	37s. 9d. to 38s. 6d.	38s. to 40s.	
Coco-nut oil:				
Cochin	59s. to 60s.	46s.	49s. 6d. to 50s.	
Ceylon	50s. to 50s. 6d.	40s.	46s. to 47s.	
English pressed	44s. 6d.	37s. to 37s. 6d.	38s. 6d.	
Copra oil:				
Ceylon	None	39s.	45s.	
Cochin	51s.	43s.	47s.	

According to the *Public Ledger* of October 13th and 15th, prices ruled as follows (per ton):—

Soya Oil.—Hull: Naked extracted, all positions, £26 10s. Oriental (in cases), August-September, £26 7s. 6d. c.i.f.; September-October, £26 5s. c.i.f.; October-November, £26 5s. c.i.f.; November-December, £26 c.i.f.; December-January, £26 c.i.f.; January-February, £25 17s. 6d. c.i.f.

Coco-nut Oil.—Ceylon spot, £50; September-October, £46 15s. c.i.f.; October-November, £46 15s. c.i.f. Cochin spot, £60; October-November, £51 c.i.f.

Palm Oil.—Lagos on spot, £35 10s.

Palm Kernel Oil.—October-December, £44 5s.; January-March, £44 f.o.b. Hamburg.

Soya Oil Beans.—Parcels Harbin spot, £8 17s. 6d. Hull; September-October, £8 16s. 3d.; November-

Actual and Estimated Production and Consumption of Rubber, in round figures, 1905 to 1921 inclusive.

I.—ACTUAL

WORLD'S PRODUCTION IN TONS

	Plantation	Brazil	Rest	Total	Consumption, tons
1905	145	34,000	26,800	61,000	61,000
1906	510	36,000	29,500	66,000	66,000
1907	1,000	38,000	30,000	69,000	69,000
1908	1,800	39,000	24,200	65,000	65,000
1909	3,600	42,000	23,400	69,000	68,500
1910	8,200	40,500	21,300	70,000	66,000
1911	14,100	39,500	22,400	76,000	73,000
1912	28,500	40,500	30,000	99,000	98,000
1913	42,000	41,000	32,000	115,000	112,000

II.—ESTIMATED

1914	64,000	40,000	20,000	124,000	126,000
1915	94,000	38,000	10,000	142,000	142,000
1916	121,000	35,000	5,000	161,000	159,000
1917	147,000	32,000	2,500	181,500	179,000
1918	166,000	30,000	Nil	196,000	197,000
1919	183,000	30,000	„	213,000	216,700
1920	198,000	30,000	„	228,000	238,370
1921	209,000	30,000	„	239,000	262,200

December, £8 10s.; December-January, £8 5s.; January-February, £8 5s.; February-March, £8 5s.

Linseed Cakes.—London made, £7 15s. to £7 17s. 6d.

Cotton Cakes.—London made, £5 12s. 6d. to £5 15s.

Copra at the opening, owing to some pressure to sell and absence of demand, was depressed, and prices gave way materially. At the close, however, a firmer tone predominated, and quotations recovered somewhat, but prices on balance are generally lower than those of a week ago.

The following are the closing quotations: Malabar, October-December, £32 10s. sellers, and January-March, £32 Hamburg. Ceylon, August-September, £32 10s. sellers, and September-October, £32 7s. 6d. Hamburg. Java, July-August, £31 15s. sellers; July-September, £31 12s. 6d.; August-October, £31 7s. 6d., and October-December, £31 buyers Holland, Hamburg, and Bremen. Macassar, July-August, £31 12s. 6d. sellers July-September, £31 10s., and August-October, £31 7s. 6d. Holland, Hamburg, and Bremen. Singapore, August-September, £31 10s. done and buyers, and August-October, £31 5s. Hamburg. Cebu, August-September, £31 10s. sellers, and August-October, £31 5s. Hamburg. South Sea Island, July-August, £31 7s. 6d. sellers; August-September, £31 5s., and September-October, £31 paid London. F.M. Straits, August-September, £31 5s. buyers Marseilles; August-October, £31 5s. buyers, and October-November, £31 2s. 6d. Odessa.

The London Cocoa Market.

By THE EDITOR.

ROUGHLY speaking, if the whole of Mincing Lane, buyers and sellers alike, had shut up their offices and gone for a holiday since our last appearance, I do not think anybody would have been the worse. Cocoa has been landed and delivered, and a few bags have been sold, but, as far as published reports go, all the business done since mid-September could very well have waited until now, mid-October, when it would have constituted an easy day's work.

Working backwards, the London stocks on October 11th leave us with 6,800 bags more on hand than shown by the table given last month; whilst Havre, on the other hand, managed to reduce hers by 17,000 bags, her deliveries of Pará, Venezuelan, Trinidad, San Thomé, Haiti and Accra kinds showing 15,000 bags excess over receipts. Here are the figures:—

London, October 11th	1912. Bags.	1912. Bags.	1911. Bags.
Trinidads	12,681	7,394	7,958
Grenadas	4,516	2,275	9,975
Other W.I.	4,550	9,772	6,387
British Africa	7,780	4,849	2,953
Portuguese Africa	4,914	7,582	3,181
German Africa	3,336	8,034	6,228
Ceylon and Java	16,194	14,132	14,634
Guayaquil	19,173	39,758	43,370
Brazil and Bahia	3,276	3,250	1,195
Other Foreign	9,630	7,966	10,462
Totals	86,050	105,012	106,343

Deduct the Guayaquils, which do not seem wanted at the moment, and the stocks run 66,877, 65,254, and 62,973 bags respectively.

Havre Stock, September 30th—	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
Pará	11,347	82 to 86	11,055	82 to 85
Bahia	4,887	78 „ 85	3,525	75 „ 82
Venezuela	57,353	85 „ 200	39,983	80 „ 200
Trinidad	22,640	83 „ 89	28,761	86 „ 92
Grenada and O.W.I.	2,196	81 „ 87	3,902	71 „ 84
San Thomé	3,536	82 „ 85	6,091	76 „ 78
San Domingo	8,840	74 „ 81	10,673	69 „ 74
Haiti	4,063	70 „ 80	9,676	62 „ 75
Accra	44,628	77 „ 80	36,403	70 „ 74
Guayaquil	15,359	80 „ 86	15,622	74 „ 82
Others	13,125	—	4,587	—
Totals	187,974 bags		170,278 bags	

Those who have our September issue by them should compare the above quotations with those given in our previous issue, and note which growths are now quoted higher. Since the beginning of October, reports from Bahia City speak of a rise out there of 2s. to 3s. cwt.; this, in contrast to previous rumours as to falling prices, and reports of bumper crops, is more noteworthy than surprising. It is now generally recognized openly, even by the more stubborn opposers to such ideas, that the shortage of supplies that has all along been keeping up prices will yet cause values to stiffen up before the tide of supplies rises high and flows sufficiently steadily and evenly to bring them down 5s. or 7s. from the top price to be. At the moment I suppose, quality for quality, San Thomé is the cheapest cocoa on the market, and then comes Cameroons, possibly because, although the San Thomé output is behind (343,189 bags, January-September, against 379,888 last year), spot parcels of these are more easy to secure than other kinds. The absence of even a single bag of Bahias among the list of those landed in Havre last month certainly does not point to an excess of supplies of that growth; London, on the other hand, received some 3,700 bags during the five weeks ending October 4th, including 2,700 in one week (viz., the one ending September 27th).

Heavy receipts of Guayaquil have tended to discourage business in this growth, in which, at one time, buyers showed some inclination of being interested. The West Indian mail just in gives what can practically be considered as the crop-year's export of cocoa from Trinidad and Grenada as follows:—

12 months (October 1st to September 27th).

	1912-13.	1911-12.	1910-11.	1909-10.
Trinidad	235,275	221,606	251,894	293,886 bags
Grenada	63,036	69,781	67,144	73,865 „

To Messrs. Martin Weinstein and Co., at Lisbon, we are indebted for the usual monthly returns of movements at Lisbon. These show an increase in the stock there of 33,000 bags, say:—

	Bags.
Lisbon stock on August 31st	50,482
Add landings in September	71,287
Gives	121,769
Less delivered in September	38,205
Leaves stock on September 30th, 1913	83,564
Against „ „ 1912	91,034

Coming home, I regret to see no signs of any improvement in the output of British manufactured cocoa compared to that imported from abroad; on the contrary, the September figures show that the foreign manufactured article is gaining ground “every time,” as the Americans say. During September only, 2,431

tons of raw cocoa were delivered for home consumption in the United Kingdom, against 2,537 last year, and 2,240 tons in 1911, whilst the nine months' total ran:—

Raw Cocoa only—	Landed.	Del'd H.C. Tons.	Exported. Tons.	Stock (Sept. 30th) Tons.
Jan.-Sept., 1911—	25,331	18,095	5,213	11,396 tons
" " 1912—	24,981	20,259	4,579	9,506 "
" " 1913—	27,603	20,504	5,178	10,996 "
Increases	2,622	245	599	1,490 "

Now coming to foreign manufactured, we find an increase compared with last year in deliveries for home consumption of 260 tons in September only, and of over 1,300 tons for the nine months, against an increase of only 245 tons for British manufactured, *i.e.*, a smaller increase than the foreign article shows during the single month of September. Certainly there is a screw loose somewhere; whether it is due to the Government, to the makers, or to the public's mistaken preference for the Continental makes it is not for me to say. Here are the figures of the foreign manufactured:—

	Landed. September only.	Del'd H.C. September only.	Landed. January-September.	Del'd H.C. January-September.
1911 ...	724	676	5,607	5,118 tons
1912 ...	1,079	1,095	7,058	7,224 "
1913 ...	1,609	1,356	9,266	8,586 "
Increases	530	261	2,208	1,362 "

Values, including the sales held on October 14th, ran as follows, and any changes in the near future will be upwards, not downwards:—

Trinidads.—Sales, at any rate spot sales, of late seem to have been confined to good middling to superior marks, which sold at 73s. to 76s., against similar values a month ago.

Grenadas have been scarce; the little business done includes fine marks at 67s. to 68s. 6d.

Jamaicas.—Fine marks have sold at 69s. to 70s., middling to fine having previously changed hands at 66s. to 69s.

St. Lucias, small lots, have been selling up to 68s. 6d. for fine, 66s. for fair reddish, and 60s. to 62s. 6d. for common unfermented.

Dominicas are worth up to 68s. for the best marks, and down to 62s. for common unfermented.

Demerara.—A nice lot of fine realized 70s. to 70s. 6d.

Montserrat.—A small parcel of bold realized 85s., and good medium 80s.

Costa Ricas sold at 67s. 6d. for fair reddish.

Honduras.—Good reddish fetched 65s.

Panama.—Fine bold sold at 105s.

Puerto Cabello.—Good clayed changed hands at 90s., and fair at 76s.

Samana.—Fair reddish has been selling at 62s. 6d., greyish red 60s. 6d.

Cameroons.—Good red fetched 66s., against 65s., or, at the outside, 66s., as the value of *San Thomé*.

Samoa.—Good bold red fetched 77s., fair 67s.

Java.—Fine bold sold at 85s.

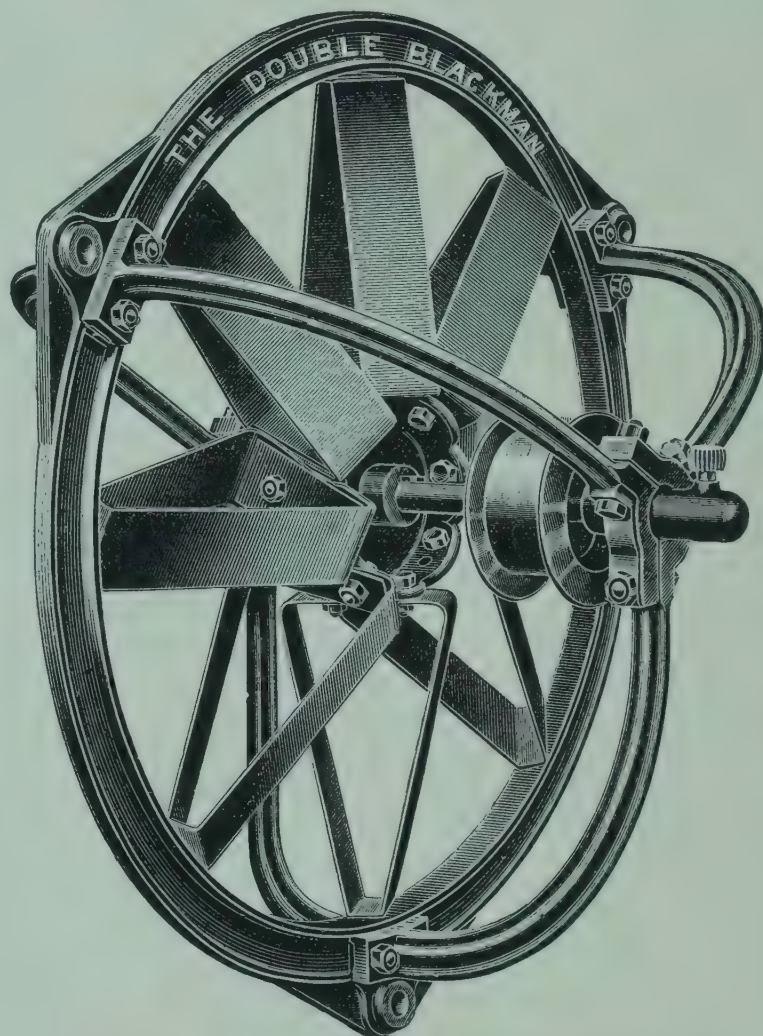
Guayaquil.—Small lots of fair Caraquez sold at 68s., and fine at 72s. 6d., whilst Arriba sold at 72s. to 76s.

Ceylon.—Fine bold sold at 85s., fair medium down to 76s. Between these extremes a fair business has been doing.

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NOVEMBER, 1913.

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The Quadri-Centenary of Cacao in Europe.

WHAT MORE FITTING THAN FOR THE LEADING MANUFACTURERS OF THE WORLD TO CELEBRATE IT BY A UNITED TROPHY-EXHIBIT AT THE COMING CACAO AND TROPICAL EXHIBITION?

To be or not to be? That is the question. Will or will not the leading manufacturers of the world allow the following chance of a century to go by for celebrating the Quadri-centenary of the introduction of "the Food of the Gods" into Europe, and of showing in friendly rivalry what they owe, and what the public owe, to the introduction of this invaluable food and drink into the households of peers and ploughmen alike throughout Europe and America?

Four hundred years ago, so the oft-told tale runs, a drink known as chocolate, and made by the Mexicans from pounded or ground cacao beans, corn-meal, and vanilla, was introduced into Spain, and spread by the Spanish monks first into France, and thence into England. When it was first introduced into America is difficult to trace, but according to a book issued by Messrs. Walter Baker and Co., Ltd., of Boston,* the first notice of the manufacture and sale of chocolate in the States was in June, 1771; although, from the wording of the notice, Amos Trask, the advertiser, must have made and sold chocolate, and also ground the beans for customers, for some years previous to that date.

Leaving this history of the past and coming to the immediate future, we would suggest that Mr. Staines Manders should approach the twenty-four leading cacao manufacturers of the world and persuade them to take space next year, thereby first proving that they are of the aristocracy of the trade, whilst at the same time they could show the producers what advances have been made in the manufactured article, and give the public, for the first time in history, a chance of realizing not only what an amazing variety of sweets and food-stuffs can be turned out in England and elsewhere, but what the modern art and profession of "Ye cult of ye chocolate" has produced for the public palate in all parts of the world. We hope that, if anything is done along the lines suggested, America in particular will take a leading part. We say this, not out of preference for America, but because 1914 will bring

* The oldest and still the leading firm of chocolate manufacturers in the States. They seem to have made chocolate, or cacao, in Massachusetts since 1765, as an adjunct to a saw-mill, one John Hannan, an Irish immigrant, who had learned the business of chocolate-making in England, having induced some friends to make the start at the town of Dorchester (Mass.). On the death of Hannan in 1780, Dr. James Baker established the house, which has grown and flourished amazingly, and still continues to do so, as everyone knows. In England, Messrs. J. S. Fry and Sons, Ltd., as we pointed out in our July issue, was founded by Mr. Joseph Fry in 1728.

with it the Centenary of Peace between the English and their American cousins, and if the quarrels started over tea, what more appropriate than that the centenary of the reconciliation should be celebrated over cacao?

Meanwhile, as at the Rubber Exhibition, many a knotty question and answer and much valuable advice and knowledge could also pass between cacao planter and manufacturer, maker and retailer, chemist and planting expert at the Tropical Products Congress to be held at the same time, as to what is the best variety of bean to produce, how long should Criollo or Forastero beans be fermented, should claying the beans be proscribed once and for all time, can the suggestions thrown out by the essayists in our book on "The Fermentation of Cacao" be helped forward to a finality, and if so, by whom and how can this be done? The plant-experts can discuss improved strains as Hudson's "Pentagona," causing his (St. Lucia) cacao to realize 83s. (see p. 220), against 67s. for the fine Forastero variety, which was the best that go-ahead island produced before his skill and knowledge introduced the new kind. Questions of pruning, inter-crops, inter-cultivation, manuring, pests and their extermination, as well as fermentation, oxidation and drying, the ideal system of drying for Bahia, of spraying trees on the West Coast, of preserving a pure strain of Criollo cacao in Mexico, Venezuela, and elsewhere, all these and many more points sadly need (for the first time during the 400 years) to be exhaustively discussed by all sides, and no such opportunity will offer itself again as at the coming Tropical Exhibition to be held in London next year, just 400 years after cacao beans and chocolate first became known in Europe. Will such an exhibit be agreed to or not? That is the question. We hope it will.

The Fermentation of Cacao.*

THE demand for this book is going strong. We understand that one firm of manufacturers has taken a dozen copies, and that copies have been ordered for the library at Kew, and for five or six agricultural societies in the West Indies. The leading authorities, therefore, in science and trade have approved of the work and found it worth buying. We are glad of this, not so much because, as with all publishers, we want to sell the books we issue, as for the reason that it shows that the right people are interested in the contents, and will therefore, we hope, encourage the carrying out of further experiments along the lines indicated until we can arrive at definite conclusions on the various points raised. This will give the planters greater confidence when following the advice offered, so that those of one centre when preparing their crops will no longer hesitate to turn out their cacao "to type" by curing it in the same way as their neighbours.

Thanks are due to our exchanges for their lengthy and detailed reviews, especially *The Ceylon Observer*, *Agricultural News*, *De Indische Mercur*, and others.

"The book is one which must attract attention. . . . It cannot be merely read, it must be studied," writes the *Agricultural News* (Barbados).

What we ask is that no one will pretend to think of the book as the last word on the subject, as, on the contrary, we have only published it as the *first* word on the questions discussed. We have not gone to the expense of collecting these essays, translating and binding them together in one book, because they show what *is*, but rather in the hope that they will lead the way for planters to learn what *may be*, as they will do if they only work according to expert advice and continue the experiments on a commercial scale until each of the important points raised is either proved to be right or wrong, and so utilized or discarded as the case may be.

"I can only express the sincere hope," writes the Editor in the Preface of the book (p. xxii), "that scientific and other experts will take up the tale where my essayists have left off, and carry it on until there is nothing more to be said or learnt on the subject." Judging from those who are buying the book, we do not think that the editor will be disappointed in his desire.

"The book has an able list of contributors," claims the *Ceylon Observer*. "It has been published to encourage and facilitate the crops produced by even the smallest buyers being carefully and scientifically prepared 'to type,' so as to cause the largest buyers to take an interest in them." "The object of this work," the *Financial Times* told its readers, "is to encourage and facilitate a standard quality of excellence in crops produced, not only by the big, but by the small growers." "The exhaustive description of the fermentation process of cacao by Hudson," urges the *Indische Mercur* to its Java, Surinam, and other Dutch readers, "and the scientific elucidations of Nicholls are unquestionably of the highest value for all such as desire to be up-to-date upon this topic. . . . A most successful book has thus arisen on the subject of the process of cacao fermentation; the question is dealt with from every possible point of view. No pains have been spared to make the book as perfect as possible. The Table of Contents is a model of completeness, and comprises, as it were, an excerpt of the book itself, whilst the Index is also admirably arranged."

We tender our best thanks to our friends for their kindly remarks.

Why the English are Prejudiced against Coffee.

BUT, OH, I SAY! WHO WAS THE EXPERT?

UNDER the title of "Unpalatable Coffee," the *Pall Mall Gazette* of October 18th tells us that "at to-day's meeting of the Metropolitan Asylums Board the Contract Committee reported that a three months' supply of coffee, purchased on the advice of the Board's expert, had proved so unpalatable that it had to be sold at a heavy loss. It was decided as an experiment to follow the practice of the Admiralty, War Office, and L.C.C., and purchase for one year by open competitive tenders." We wonder what that coffee was made of, and whether it was analysed to show why it had proved too unpalatable for the inmates of lunatic asylums, and the other institutions under the care of the Board.

* Price 11s. post free. For full table and particulars, see advt., p. xvi.

"Coco-nuts—the Consols of the East."

THE SECOND EDITION COMPLETED.

REGARDING the second edition of "Coco-nuts—the Consols of the East,"* the book is being pushed on with all speed. Every word of matter has been sent in, and some 150 to 200 pages will be added, whilst the price will also be increased to 12s. 6d., or 13s. 6d. post free. Without waiting to check the additional sections too carefully, we can say that they will include:—

- (1) The cost of making copra.
- (2) The Nasicornus beetle fungus.
- (3) Cost of planting and making copra in Trinidad, B.W.I.
- (4) Horses (Army remounts) and cattle on coco-nut estates.
- (5) The article on the manufacture of coir will be entirely rewritten and brought up to date.
- (6) Edible butter and its manufacture.
- (7) Samoa notes *re* Rhino Beetle, and present prospects.
- (8) The Solomon Islands.
- (9) Mr. H. H. Thiele, Secretary of the Fiji Planters' Association on "Coco-nuts in Fiji."
- (10) Farming with dynamite, &c.

It will therefore be seen that the new book will be considerably extended and brought up to date in every way possible.

Oil from Raisin, Grape and Rubber Seeds.

THOSE who have smiled, and their number has not been insignificant, at our anxiety to show readers how to make money out of rubber and tea-seed, should study *U.S. Bulletin* No. 276, issued by the indefatigable Bureau of Plant Industry, on "The Utilization of Waste Raisin Seeds," which, we are told, yield syrup, fixed oil, tannin extract and meal. If it pays to give attention to such an article, we certainly cannot believe that wise planters will allow tea or rubber seeds to go by unnoticed. The raisin-seed oil, it is said, can be extracted by pressure and by solvents. The important application of the oil in commerce, coupled with the large output available annually, should justify its production. The clear, amber-coloured, fixed oil, useful in paint and soap manufacture, and possibly in other industries, is capable of being produced in large quantities from the waste seeds. Hot extraction by means of hydraulic presses would possibly yield the maximum of fixed oil. Cold pressure, having a tendency to incompletely extract the oil, would leave more fat in the press cake. Extraction by means of solvents, such as benzene, carbon bisulphide, or low-boiling gasoline, or preferably, carbon tetrachloride or trichlorethan, is practised commercially because of the more complete exhaustion than by pressure, especially of materials with low oil content. The use

of carbon tetrachloride and trichlorethan has been recommended because of the non-inflammable, non-explosive properties of these solvents, both of which have comparatively low boiling-points and are easily recovered. They are also capable of being used again for the same purpose.

Meanwhile, we note that the *Indian Trade Journal* discusses grape-seed oil as follows: "A contemporary gives the following details regarding a new industrial process—that of expressing oil from grape-seeds. The paper states: Grape-seed oil is prepared in certain parts of France, Italy, and Wurttemberg. That obtained cold from the first pressing is edible; the oil obtained by pressing and heating and that extracted by means of solvents have a dark colour and a bitter taste, and, after being purified by concentrated sulphuric acid and cleared with bone black, are used for lighting purposes, and in the manufacture of soap and, on account of the small cost, would be a good substitute for the expensive oils used in the textile industry. Aside from the uses mentioned, and because some of its chemical properties are similar to those of castor oil, grape-seed oil has suggested itself as a substitute for castor oil in the preparation of compounds used in the manufacture of red colours. It can be calculated that, on an average, the fresh refuse of the grape contains 25 per cent. of seeds. According to the variety of the grapes and their degree of ripeness, the quantity of oil which can be rendered from the seeds varies from 6 to 20 per cent." In these days when the utilization of by-products and waste material has almost become a fine art, the above is worthy of attention, if only to lead our readers to consider what can be done in other directions. Meanwhile, it is interesting to note that the following letter appeared *re* rubber seed oil:—

SIR,—Your extract from the *Tropical Agriculturist* on the subject of the utilization of rubber seed comes at an opportune time, when a small profit from a by-product might just save the situation for some estates in specially unfavourable circumstances, and make quite a useful addition to the dividends of even the most successful plantations.

On one estate I know of, these seeds are gathered up by women and children into heaps and burnt, to prevent the growth of seedlings, which are a serious addition to weeding expenses.

I am aware that the proposition is by no means new to F.M.S. planters; but hitherto the restriction to bullock-cart traffic on the roads, and the delay and difficulties in getting trucks on the railways for so bulky a freight as even the decorticated and dried kernels, added to the high rates and freights comparatively to the value of the goods, has not allowed of a sufficient margin for profit.

Neither would any price which a miller at one of the ports would be able to afford to pay for seed on the estate, to allow for expenses of transport and milling seem to be worthy of a planter's attention. The profit of £1 per ton to the planter mentioned by Mr. Wicherley, would be considerably less here in all probability. At the same time, there is a great demand for this oil for the manufacture of oil-cloths, oiled silks, linoleum floor cloths, linerusta, and also in soapworks, in the manufacture of paint and varnishes, and possibly many other trades.

* Strange to say, quite a number of those who order, or talk of the book, simply call it "The Consols of the East." Many maintain that the returns on these Eastern Consols are as safe as those on the home-made article, and far, far more remunerative. The last order to hand was from Australia for 100 copies, whilst a Ceylon firm wants 78, and several orders for two and three dozens, besides individual orders, are waiting to be satisfied.

My object in writing this letter is to suggest that the planter might keep all the profits in his own pocket, by producing the oil itself in his own factory. The seeds could be dried in the sun on a flat surface of dry earth or cement, or on galvanized iron sheets in tiers one over the other in frames, as is done with fruit in Australia, or coffee out here.

A bark washer used without water might do the decorticating, and the dried kernels could then be passed through an old pair of worn-out rolls (as an experiment) for the extraction of the oil.

According to the analyses given, 50 per cent. of this dried kernel is oil. The quantity obtained from (say) 10,000 seeds, should therefore be sufficient to form a sample to be sent home for valuation. If the dried kernel is worth £9 10s. a ton at any home port, the oil should be worth at least £25 a ton. The cost to the planter would be next to nothing, as no additional power, machinery, or labour would be necessary, and no special skill is required in any stage of the process. In the hope that someone will try it and let us know the result,

Yours, &c.,

Kuala Lumpur,
July 4th.

J. E. BACH.

Rubber Planting in Southern India.

THE QUESTION OF SYNDICATE-OWNED OR CO-OPERATIVE MOTOR SERVICES.

THOSE who, like ourselves, are interested in rubber-planting in Southern India and want to see this industry out there prosper, can derive much information of the chances estates have of doing well by studying the reports as they are issued. Doing so has the advantage that if the reports are correct, as we take it they are, you have facts and not theories to deal with, and are therefore enabled to arrive at more certain conclusions than has hitherto been the case. As regards the average price of Travancore rubber in London, we can compare the 4s. 1d. per lb. (against 4s. 8d. in 1911) obtained by the Travancore Rubber Co., Ltd., with 4s. 0½d. secured by the Orkaden River Rubber Co., Ltd., and 4s. 0½d. of the Paloor Co., Ltd. Those desiring to know the gross average price in London during 1912, can therefore put it safely at 4s. on a well-managed estate. Against this the Travancore Rubber Company claims the cost of production to have been 1s. 6d. per lb., or 1s. 10d. per lb., after taking all outlays into account. Like cacao, rubber comes in with a rush during three or four months of the year, no less than 34,332 lb. of the 1912 crop of the Travancore Company, or more than one half the total crop (59,168 lb.) being secured in October, November and December, and this we are told, applies to most of the rubber estates in Southern India.

With the agitation going on in the East and elsewhere for increased and improved transport facilities, it is interesting to note that the three companies mentioned are seeking to solve the difficulty by running a joint motor service from which they hope to derive benefits as regards regularity and speed of deliveries, and the latest news pointed to the motor service having practically superseded the old system of bullock transport. So far as we can ascertain the service is run by a syndicate, the

shares of which have been taken up by those wishing to secure the advantages of the improved service, not only for goods but for passengers as well, and whilst the estates will benefit by saving time and money, the shareholders look to receiving a fair dividend on their money. Estates in other districts suffering from the drawbacks of an irregular or insufficient service should note this, as they could run motors on similar lines. Ceylon planters have long been clamouring for commercial motors, and some vehicles, we are told, have been sent out to relieve the congestion in the goods traffic. If the Society of Motor Traders would follow our advice, and do as the gas, telephone and other companies have to do, viz., act as a central educational body to prove to planters the advantage of running motor services on co-operative lines, as our Indian friends are doing, then the sale of commercial and passenger cars of English make would receive a considerable impetus. This would, at any rate, be the case where we circulate in Latin America and elsewhere. Take the Philippines, for instance, the official reports show that owing to the havoc wrought by rinderpest amongst the animals, they have had to be replaced by motor traction, which conveys goods and passengers along the flat, up the hills and in and out the long and winding passes in a way that animal traction could never compete with, so long as the bridges are strong enough for the loads, whilst the rates are much less than those asked by the mule teamsters or bullock-cart owners. This being the case we hope both for the good of the long-suffering planters and merchants in the Tropics, as well as for the prosperous, but slow-to-advertise, motor makers over here, that more attention will be devoted in future to establishing regular motor services in the Tropics wherever the roads and bridges allow of this being done.

At a meeting of the Board of Agriculture, Trinidad, the subject of spraying cacao was discussed. The Entomologist recommended spraying russet-coloured pods as soon as they are observed, since this condition generally indicates the occurrence of thrips. In connection with the cacao beetle pest, a spraying demonstration has been arranged by means of which it is hoped that the interest of the planters may be fully aroused as to the practical value of the operation.

In last December's issue we discussed in detail the possibility of preventing the spread of, and otherwise eradicating, *Bacillus coli*, said to be the cause of bud-rot in coco-nuts, by the use of Izal; this month a correspondent in Singapore writes: "We have been advised by the manager of a rubber estate, who had been receiving frequent complaints concerning his shipments of rubber arriving at their destination in a mouldy state, that he made the experiment of mixing a very small quantity of Izal with the latex prior to coagulation, and that since he has done so he has received no further complaints."

WE understand that a second and much enlarged edition of "Tropical Gardening and Planting," by Mr. H. F. Macmillan, F.L.S., &c., Superintendent, Division of Botanic Gardens, Ceylon, is in course of preparation. Its appearance will, we feel sure, be welcomed by our readers.

The Recovery of Sandy Wastes.

AWAY back in our April issue last year we referred, on p. 65, to the report of Dr. L. Cockayne, of Wellington, New Zealand, on "The Sand-dune Areas in New Zealand and their Reclamation" by means of Marram grass (*Ammophila arenaria*) which checks the sand from spreading, and in dying supplies humus, and enables pine-trees, if nothing else, to be planted. Now the *Monthly Bulletin of the International Institute of Agriculture* at Rome for June, in paragraph No. 690, calls our attention to a report on "A New Method for the Afforestation of the Sandy Portions of the Great Hungarian Plain (Alföld)," by Ferencz Kiss, Chief Counsellor of the Department of Water and Forests, in *Erdészeti Lapok*, Year LII, part vii, pp. 290-318, Budapest, April 1st, 1913, which was presented on March 14th, 1913, to the National Forestry Society and dealt with the afforestation of the sandy parts of the Great Hungarian Plain. This afforestation was intended at the beginning to protect the neighbouring pastures and cultivated land from the encroachment of the moving sands of the adjacent steppes, and the work was begun 100 years ago, but its economic utility was only considered after the continual labours of a century had unexpectedly been crowned with success. At first, black poplars were planted, and it was only in 1870 that *Robinia* took exclusive possession of the wooded portions of the Alföld. The writer gives a biological study of the flora of the Great Hungarian Plain, including *Robinia*, which tree, in his opinion, is not capable of improving the poor soil. He recommends a new method, which does not confine itself to the afforestation of land suitable for tree plantation, but extends to the reclamation and improvement of a large portion consisting of sandy soils and sand-hills, which hitherto has been little used owing to the poverty and dryness of the land. The writer attests the excellence of Austrian pine for preliminary planting, as it renders the soil suitable for the cultivation of more remunerative forest trees.

The island of Porto Rico has, in proportion to its size, a considerable area of swamp and marsh lands. The good land, which may be used profitably for the growing of sugar-cane, is practically all under cultivation now, and the question has recently arisen as to whether the extended marshes, which are found along the coast, may be reclaimed to produce cane at a profit. A beginning has already been made, and in Bulletin No. 4 (English edition), issued from the Experiment Station of the Sugar Producers' Association of Porto Rico, Mr. F. W. Zerbau discussed "The Salt Marshes of the North Coast of Porto Rico" in a manner that any one having similar lands might be glad to know of, especially as Mr. Zerbau, who was the Station Chemist up to January 1st last, when he resigned, tells us in conclusion that it seems now quite certain that these marsh lands can be reclaimed and cultivated to produce good crops of cane. We should also suggest planting up experimental areas, at any rate, in some centres, with rice and coco-nuts.

We call attention to the matter so that those owning or interested in such lands can realize that sandy wastes can be held in check and even driven back so as to allow harmful waste-lands to be utilized, instead of continuing to spread desolation around.

The Public and Pests.

TO get the British Public to seriously listen to and discuss the Tropics and tropical industries is, at times, like having to pull down a brick wall with one's hands, that is to say it is a long, painful job, and can only be accomplished by dogged perseverance. Where human effort has often failed, however, the "green bug" has succeeded. Whilst some of the London papers have been shamefully silent over questions of the utmost importance to the Tropics, such as the establishment of Agricultural Colleges out there, yet they find the "green bug" sufficiently interesting to devote a long half column to it, and why? Simply because as investors in rubber companies they are afraid it may affect their dividends. For this reason they talked glibly of the "Bug Hunter," as it makes a good head line, and then we were pleased to note, they praised Professor Maxwell Lefroy and the Imperial College of Science, and spoke more or less correctly about rubber in the Tropics, but there is never a word about establishing an Imperial College in the Tropics, by which means alone can the green bug and many other pests be properly studied and exterminated.

WITH the attention now being devoted to the extraction of vegetable oils important orders for presses are being received by our advertisers. Among these Messrs. Hollings and Guest, Ltd., of Birmingham, are making a very large one, which will shortly be ready for delivery. Planters and others often fail to realize the many uses to which presses of one description or another can be put, and the wide area over which they are regularly used. This same firm (Messrs. Hollings and Guest, Ltd.) have supplied baling presses for cotton, wool, oil extraction, fibre packing, and also in large numbers, especially for tropical estate use, for taking off and fixing the tyres of commercial motors now in general use, and which, like TROPICAL LIFE, are to be found throughout the Tropics, orders having been received from and presses sent to Papua, Bahia, New Zealand, Australia, Madras, Bombay, Calcutta, Straits Settlements, Colombo, Cochin, West Africa, and, in the sub-Tropics, Madeira and Johannesburg.

The Know-all Agriculturist and the Instructor.

GOVERNMENT experts and agricultural instructors and others in the Tropics, when they feel disappointed at finding themselves up against an extra high and hard brick wall in the shape of an agriculturist who cannot be made to own that he is *not* the only man in the district who knows anything about planting, may gather a glint of comfort from the following paragraph showing that things are as bad, if not worse over here, since a man who aspires to being, and has even been elected, an Alderman, could have made such a statement as the one at Kesteven is reported to have said, according to the following paragraph:—

"By the casting vote of the Chairman the Kesteven (Lincolnshire) County Council yesterday decided to appoint an agricultural instructor and organizer at £350 a year. 'Farmers knew their business better than people could tell them,' said Alderman P., opposing the proposal."

TEA NOTES.

Referring to our notes last month on the alleged Government encouragement of emigration from India to the discouragement of recruiting for India's own estates, the following note, over the initials N. I. K., appeared in the *Planters' Chronicle* of Bangalore of October 18th:—

"It has been pointed out to me that the Government is never likely to do anything which might curtail emigration, because the smaller the population the less chance there is of famine, and if by any chance there was a famine that it is more easily dealt with; also that a non-increasing population means less work and the same pay to all officials whatever else happens. I believe many statistics were put before the Government within the last two years, showing the shortage of labour for mills and many other industries, with no result. If emigration was curtailed, all industries would have sufficient labour, and any surplus would have to cultivate the land and so reduce prices of food-stuffs, but it would mean more work for officials until the Government had been made to realize that more were needed. I am informed that the shortage of food-stuffs is due to the cultivator having found that it pays better to grow cotton, indigo, &c., or work on estates."

Messrs. McMeekin and Co., in speaking of the future supplies of tea, tell us that published figures show a considerable falling off in the quantities printed at auction during the five months of the season which have elapsed, and the importations in the aggregate from all sources of supply show only a small increase. The reserve of stock is, therefore, being eaten into and it seems doubtful whether the increases in production expected later from India, Ceylon, and Java will prove sufficient for requirements, having in view the manner in which both home and export demands are increasing.

Writing on November 13th, Messrs. Wm. and Hy. Thompson reported that imports of all tea during October were $3\frac{1}{2}$ million lb. in excess of last year; Home Consumption and re-exports were stationary, so that the stock at the close of the month was $5\frac{3}{4}$ millions less than a year ago, and as stocks at the end of September were $9\frac{1}{4}$ millions down, it will be seen that all the increased imports during October have been added to holdings, so it would appear, therefore, that the high level of value is tending to affect consumption.

The market, however, is still active and demand continues strong for all descriptions, common tea remaining very firm to occasionally dearer. The offerings are chiefly comprised of ordinary medium qualities, but they are of a useful type and mid-season teas from Assam are above last year's standard. The value of good common whole-leaf is now level with that ruling during October and November, 1911.

The average for the whole sale of Indian teas on Garden Account is $9\frac{1}{4}$ d. per lb., compared with $8\frac{1}{4}$ d. per lb. a year ago, whilst Ceylons realized $9\frac{3}{4}$ d. per lb. compared with 9d. per lb. a year ago.

In the producing districts of Northern India rain appears to have been fairly general towards the end of October after a somewhat dry period, and prospects are quoted as fair. The close of the season will, however, largely depend on whether the late rain is followed by sun during day and not cold nights, as

a low temperature will bring an early close, so that the end of October and the early days of November are always anxious times for the planter as to whether estimates will be reached and whether any increase made will be maintained.

The London market maintains its strong position, while the statistical position is increasingly sound.

Both in our last issue as well as above we touched on the difficulties in meeting the labour supply, as necessary as capital to the industry. Since then the reply to the memorial to Government in August, 1912, has been received, and during the next few months the industry will be busy negotiating with the Government to secure adequate protection for its labour supply imported at great expense, when the indenture system ceases to apply to the labour districts in July, 1914. It is to be hoped that a satisfactory solution may be arrived at, it being as much to the advantage of Government as to the industry to assist the flow of immigration, as quite 60 per cent. of the immigrants settle down as cultivators in the Province, or remain in other capacities.

THE third quarterly number of the *Bulletin of the Imperial Institute* contains, among the reports of recent investigations, the results of examination in the laboratories of the institute of a large number of samples of cotton from Uganda, of new Colonial and other tanning materials, and of essential oils from various Colonies. Among the special articles is one of exceptional interest and value by Dr. Walter Busse, of the German Imperial Colonial Office, who outlines the organization of experimental work in agriculture in the German Colonies, with special reference to tropical possessions in Africa. An article on the coal resources of Canada, based on official sources of information, gives a comprehensive survey of the subject (together with a bibliography) which will be new to most readers, in so far as the large output in British Columbia and Alberta is concerned, as compared with that of Nova Scotia. The increasing demand for wood oils should direct attention to an illustrated article by Mr. Ernest H. Wilson, the well-known traveller and collector, on Chinese wood oils, the production of which in various parts of the British Empire is strongly recommended, and also in the Philippines (see p. 214).

The *Bulletin* concludes with some general notes and reports of recent progress in agriculture and the development of natural resources, together with notices of recent literature.

THE Christmas number of *Truth*, just to hand, is brighter than ever, both as regards the colouring of the pretty pictures and plates, as well as the wit and humour of the nursery rhymes brought up to date, with Sir Edward Carson as Humpty-Dumpty, Mr. Lloyd George as the walrus, Lord Murray as many things, Mr. Winston Churchill in the Ogre's den. The Marconi controversy stands out prominently. One plate depicts Lord Murray, Mr. Lloyd George, and Sir Rufus Isaacs dancing the Tango before the shocked matrons, in the persons of the leading members of the House of Commons. For a shilling, or sixteen pence with postage, our readers can rely on having an instructive and amusing Christmas with *Truth*.

Motor Traction for the Tropics.

ACCORDING to the *Indian Motor News* of Bombay and Calcutta, the motor-car has gone with a boom in India, and many manufacturers at home are reaping a rich harvest from the trade in them in that country, though for its size and brand newness the Federated Malay States have rather put India in the shade in respect to motor-cars. There is no country in the East that has roads to compare with the well-kept thoroughfares in the Federated Malay States. They are ideal for motoring, and though they are not as wide as some of the Indian roads, this defect is minimized by the comparative absence of the objectionable bullock carts and pariah dogs which detract so much from the pleasures of motoring in India. The Federated Malay States for their size are also ahead of India in the employment of commercial vehicles, but we are glad to learn that the official element throughout India is waking up to the advantages of employing motor vehicles out there, and this is especially noticeable in Karachi, which is so go-ahead in many respects. We have heard it noted that a motor vehicle is to be utilized shortly in connection with our postal service in Bombay. If the rumour turns out to be true it will be a step in the right direction. There are many ways in which the motor vehicle can be utilized with advantage, as is proved at home; but, of course, we move slowly in India. Of late, it is satisfactory to note, a slight spurt has been put on; and we are thankful for small mercies!

Although we have heard that more than one consignment of motor lorries have been sent to Ceylon to help overcome the transport difficulty in that island, there are many who put greater trust in cableways as the more speedy remedy for the difficulty, and we certainly agree with the *Ceylon Observer* when it says that if the introduction of motor transport has to wait for the improvement of the roads, it could not be hoped to see them introduced—at least, in the present generation. At a meeting of the Kotmale Planters' Association, on July 8th, the matter of cableways was discussed exhaustively, and the Chairman explained to those present the conditions relative to cableways to serve their district and for delivering produce at Hangran Oya siding. After the discussion it was resolved that the necessary figures asked for by the consulting engineers be furnished, with a view to eliciting the cost of such means of transport, after the preliminary survey has been undertaken.

"A Limited Company," the *Indian Planters' Gazette* tells us, "is shortly to be launched in Bombay to import the necessary fleet of motor lorries to supersede bullock-carts, under the name of the Western Transport, Ltd. The proposal is to import, at the outset, a fleet of about twenty motor lorries at a probable cost of Rs. 2,50,000, which will make the use of bullock-carts in carrying large and increasing loads of merchandise in Bombay from one place to another unnecessary, and when the fleet is at work the suburbs will be included. At present the price of carting cotton goods varies from six annas to ten annas, the average being six annas in the dry weather and ten annas in wet weather, per bale of 400 lb. of cotton from Colaba to Parel, while the Western India Transport Co., Ltd., propose to charge only five to

seven annas throughout the year, according to distance. It is expected that these motor lorries will be running on the streets of Bombay by the end of November." We would suggest to many of our readers outside Bombay that they should form similar transportation syndicates, for the lack of adequate transport facilities is bound to keep back many centres where we circulate. Governments, unlike Providence, do not always help those who help themselves; it behoves those, therefore, who do not wish, like the bullock-waggons, to stick in the mud to help themselves, and they can do so in no more telling manner than by adopting cableways and motor transport for dispatching their crops from estate to railway and port, and bringing back imported goods by the same means. We have also something to say regarding syndicate-owned commercial motors on p. 204.

WE have had the pleasure of receiving a letter from Dr. Fredholm (the author of the important series of articles on "Coco-nuts" which appeared in the West India Committee Circular a little time back), who recently left Trinidad, W.I., to take up an important position in Porto Rico. In this letter our friend complains that he no longer sees *TROPICAL LIFE* and misses it very much. He therefore proposes to become a subscriber, but pays a still greater compliment to our Journal by stating that he would be glad if we could supply him with a complete set of numbers right away from the start in 1905, less a few copies he has of his own. Unfortunately several of the issues are missing, the demand having exceeded the supply. We are, however, informing Dr. Fredholm which copies we can supply.

Mr. Gordon Howitt, B.Sc., whose reviews and notes have from time to time appeared in our columns, writes from Cape Town that changing about has also caused him to miss our paper and asks us to remedy this drawback, which we are doing.

SOME rubber trees were grown on the experimental farm of the Agricultural Department of the Tippera State in Eastern Bengal, says their report for 1912-1913, and they thrived splendidly, thus showing the suitability of the soil to the growth of the Hevea variety of rubber at least. The commercial prospects of rubber cultivation are now being looked into, reports the *Indian Trade Journal*. In face of this we shall hope to hear more of rubber-growing from those parts.

NOTES taken from the last issue of the *London Chamber of Commerce Journal* show that agricultural machinery and implements of British make, such as meet with favour in India and Egypt, should apply specially well to the needs of the farmer in Mexico. The largest agricultural machinery retail firm in Guadalajara has sold upwards of £300,000 worth of such machinery during the past ten years, while there are two other distributing firms nearly as important. When Mexico does settle down, the orders for such goods will be heavy, so the Republic is worth watching.

The French Rubber Manufacturers Support the 1914 Rubber Exhibition.

WILL THE ENGLISH ONES FOLLOW THEIR EXAMPLE?

THE Syndicale Chamber of Rubber Manufacturers, Paris, of which our old friend, Monsieur G. Lamy-Torrillon, is the President, met recently, and unanimously decided to give the Fourth International Rubber and Allied Industries Exhibition, to be held in London next June, their official recognition. This now completes the list of important Associations in all parts of the world connected with the rubber industry, producing and manufacturing, who have accorded the coming Exhibition their recognition, and the following is the list:—

The Rubber Manufacturers' Associations of France, Germany, Austria, and Belgium; the Rubber Club of America, the Rubber Growers' Association of London, the Planters' Associations of Ceylon, Indo-China, Belgium, British Malaya, Malacca, Johore, Southern India, Java, the Rubber Association of Holland (Amsterdam), the Commercial Associations of Pará and the Amazonas, the Republic of Péru and other producing countries; the Chamber of Commerce, and the various departments connected with agriculture; also all the important Exhibition Associations in all parts of the world. Every important producing country will be officially represented. The only query that remains to be answered is: With the already enormous but still rapidly increasing demand for motor tyres, and manufactured rubber goods generally throughout the Colonies and Tropics, as well as in Europe and America, will the English manufacturers follow the lead of their competitors, and so assure for themselves a share of this new world trade, or will they persist in hiding their lights under a bushel and continue to force the few orders to run after them, instead of their running after the many?

THE other day the post brought us a small paper-covered book, with a picture of Truth (bearing the price of the book, 1s., on her mirror) and sundry politicians depicted on the cover, with a flagstone-drawing of a man dragging—what—could it be a red herring? At any rate, it was some sort of fish—across the pavement in front of them. Thus was *Truth's* "Minor Statesmen" introduced to our notice. On opening the book we found this, our shillingsworth, consisted of a series of complimentary calumnies on "Illustrious Men, including Mrs. Pankhurst." As we were not sure of Mrs. Pankhurst's views on the Plumage Bill we left her to fight His Majesty's Ministers and the police force, and made use—and good use—of several of the "complimentary calumnies" in connection with our two last issues of *TROPICAL LIFE*, in which we discuss several controversial matters that need reforming in the unreformed House of Commons, so wanted to pick out the right members to send copies to. These the book helped us to find. Those seeking to do the same, or wishing to learn in a semi-jocular way, many little side-truths of the second bench of our M.P.s will find, as we did, that *Truth's* "Minor Statesmen" (*Truth* Office, 10, Carteret Street, London, S.W.) an amusing but very useful "bob's-worth."

The Death of Mr. John Ferguson, C.M.G.

Too late to do so in the October issue, we now hasten to add our mite of tribute to the memory of Mr. John Ferguson, C.M.G., the founder of the *Tropical Agriculturist*, and for many years Editor of the *Ceylon Observer*, who crossed that bourne from which no traveller returns on October 18th. Tropical journalism has, one might say, lost in him the father of the modern school of writing, and most certainly so in connection with economic botany and the extension of British trade in the Tropics. Brought up as we were in the happy-go-lucky, learn-as-you-can school of Latin America, we owe much to what we read fifteen years ago in the *Tropical Agriculturist* (which was started in 1881), and through that publication we therefore owe much to Mr. John Ferguson. As "we" are but one of many thousands engaged in tropical enterprise, Mrs. John Ferguson, Mr. Ronald Ferguson, the present Editor of the *Ceylon Observer*, and their relatives cannot but feel proud of the work done by this "Grand Old Man" of Ceylon in the seventy odd years of his healthy-minded, strenuous, and useful life, which has left behind so many monuments of its energy and industry, "The Ceylon Handbook and Directory" being but one of several of these.

Alcohol from Wood and Tropical Waste.

IN face of the offering by Argentine owners of large tracts of land for sale, covered with pines (*Araucaria imbricata*), in order that the purchasers can make cellulose from the wood, the following paragraph, taken from the *Indian Trade Journal*, is worth noticing as offering valuable suggestions for increasing the world's supply of alcohol, and at the same time to utilize what would otherwise be but a waste product:—

"The chemists of Sweden," we are told, "have experimented in a variety of ways to solve the problem of manufacturing alcohol from wood, and thus find an additional source of revenue from the country's forest wealth. In the production of wood pulp by the sulphite method, there is a waste product that the chemists have finally been able to utilize with profit in the production of alcohol. The profitable utilization of the exhaust lyes drawn off from sulphite boilers has always been a problem. For every ton of cellulose made by this process there are 10 tons of these lyes. They contain one-half of the weight of the wood originally introduced into the boilers. Among the matters present are dextrose and various other sugars, xylose, acetic acid, tannic acid, nitrogen compounds, resins, &c., as well as the calcium lignin-sulphonate, the chief product of the reaction. Of the sugars present most are susceptible to fermentation. They constitute about 1 per cent. of the lyes. The treatment of the liquid is comparatively simple. It is first neutralized with calcium carbonate, after which yeast is introduced. When the fermentation is complete the alcohol produced is secured in the ordinary manner. The process yields 6 gallons of alcohol (100 per cent.) for 1,000 gallons of lye. About 14 gallons are secured for every short ton of cellulose."

We cannot pretend to offer any suggestion as to whether the production of alcohol along such lines would pay, but the process is certainly worthy of

attention, and, as we point out in our book on "The Fermentation of Cacao" (Preface, p. xxvii), not only coco-nut planters who at present let the milk run to waste, but cacao planters with their vinegar, and sisal and manila growers with their fibre waste, could all make alcohol from these by-products, which at present tend to be a nuisance. As regards cacao it is estimated that the world's crop of some 227,500 tons annually offers over 10,000,000 gals. of liquor capable of being turned into alcohol every year, whilst with the other industries the quantity of waste and milk, at present a nuisance and expense to get rid of, but proportionately, to the acre, far in excess of that of cacao, it must be very large in the aggregate.

The Colossus of English Journalism.

MR. J. L. GARVIN, the well-known leader-writer and editor, who has been, not inaptly, described as the power behind the House of Commons, when proposing the health of the President of the National Advertising Society Benefit Institution, in the person of Alfred Harmsworth, Lord Northcliffe, said (we quote from the *Daily Telegraph*), "that if a man succeeded in setting the Thames on fire he must occasionally expect his ears to burn. When Lord Northcliffe was not present he was quite frequently a topic of discussion among his friends and other acquaintances, and the one thing on which they most agreed was that they could never get to the end of the subject. When speaking of Lord Northcliffe he would like to refer to the superman of business and the human man of social life. Lord Northcliffe's career could be described only as prodigious and unparalleled. He controlled innumerable publications, an enormous number of hands, great machinery of transport, and upon the other side of the Atlantic a whole town and regions of forest. When they thought of these huge activities, and that they were all the results of ideas in the mind and brain of a single man, they must admit that it was one of the most remarkable examples of sheer creative and constructive genius in the records of modern organization. The Chairman was a standing proof of the maxim that facts were stranger than fairy tales. He had passed through stages any one of which would make the fame of another man. He became the youngest created peer of Parliament and proprietor of the *Times*. There was a tale of real life which knocked Dick Whittington into a civic cocked hat. Lord Northcliffe, however, in addition to his business qualities, had a wonderful amount of personal magnetism. His friends had a personal regard and affection for him which no public difference could ever shake."

THE spice island of Pemba, which lies in the Indian Ocean, off the coast of German East Africa, some sixty miles north of Zanzibar, has an area of about 300 square miles. It is chiefly noteworthy for the fact that, with Zanzibar, it produces seven-eighths of the world's clove crop, and the Pemba crop is about three times the size of the Zanzibar crop. The clove, however, is not indigenous to Pemba, having originally been brought from the Moluccas, but the conditions of Pemba are so suitable that the trees grow wild. Unfortunately, the climate of Pemba is so unhealthy and

unsuited for European residents that there seems to be little prospect of improving matters or of developing the island's resources in other directions. After the clove industry the manufacture of copra is the only one of any importance, but mangrove trees flourish in great luxuriance, although at present the industry has not been developed.

Economic Zoology.

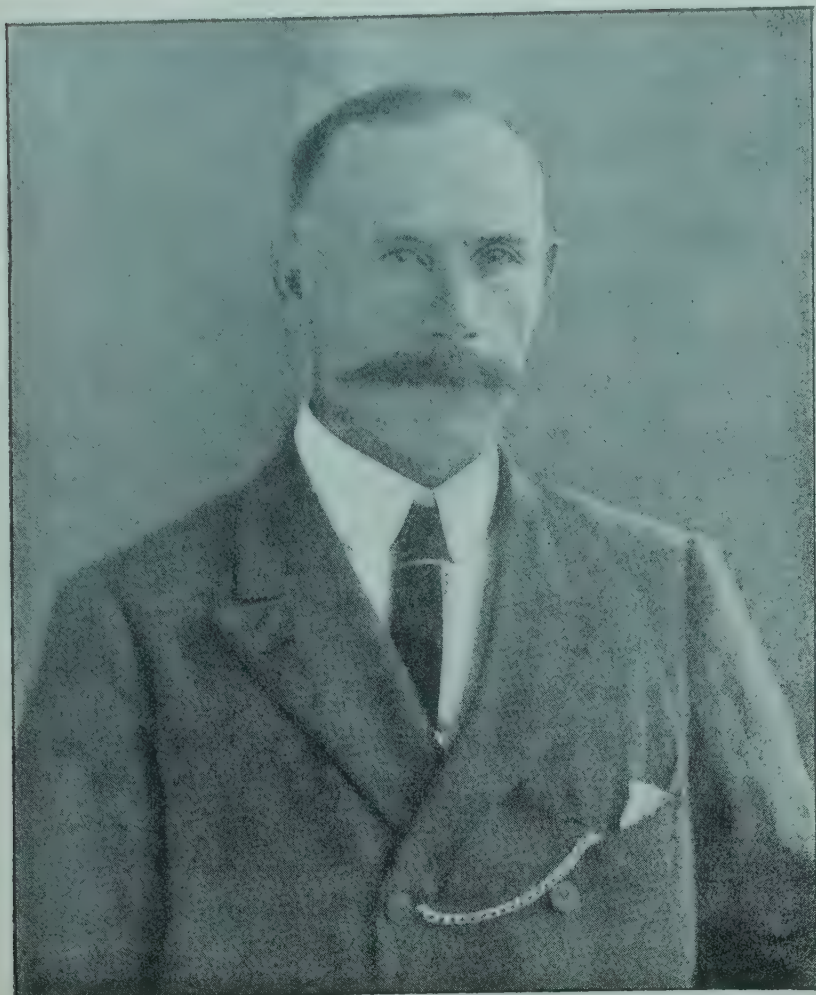
Our Motto: "Utilization not Extermination."

CAN MULES BREED?

La Hacienda shows a photograph that says Yes! How often, we wonder, have all those to do with estate work, either in North or South America, as well as in many other centres, discussed the "whys" and the "wherefores" that prevent a mule from breeding. We have always understood that such a thing is impossible. Venezuelan llaneros, American breeders, negro overseers, Spanish hacendados, East Indian coolies, even Portuguese and Chinese shopkeepers, have all in turn discussed the matter with us, and proved conclusively that for a mule to foal is impossible. In spite of all this, our contemporary, *La Hacienda*, of Buffalo, triumphantly includes a photograph of a mother mule and a foal, with these words underneath (see their August issue, p. 349): "Mula que dio á luz un potrello en la Hacienda Hortela, Pilar de Alagoas, Brasil." (Mule which gave birth to a foal on the Hacienda Hortela, in Pilar de Alagoas, Brazil.) Surrounding the two animals, which stand side by side, is a crowd of twelve men and boys, and probably there were others that could not be squeezed in the picture. We wonder whether all of these realized at the time how many tongues will be set wagging again over this evergreen controversy, at the sight of the photograph of this mother and son, since *potrello* not *potrella*, is used.

To further remove any doubt on the matter, we reproduce the following paragraph from the *Agricultural News* of Barbados, W.I., of a similar case in Cyprus, but in this instance it will be seen that two young mules had made their appearance. This would disprove any claim of the occurrence being a freak.

Under the heading "A Fertile Mule," our West Indian contemporary reports that some very interesting correspondence recently appeared in *The Field* (August 2nd and 9th, 1913) concerning the case quite lately observed in Cyprus, of a female mule with foal at foot. The observations were recorded in the first instance by G. J. Harvey, M.R.C.V.S., Government Veterinary Surgeon, Nicosia, Cyprus. When called to the case he was informed that the foal was the second one born; last year the animal had given birth to a filly foal which lived two months. The present one was a colt foal two months old by a jack donkey and resembled somewhat a young donkey, but was bigger. The mule herself was 6 years old, 13.2½ hands high, and bay with black points. There were no special marks or stripes, and the animal was of a very good type. Inquiry seemed to indicate that she was bred from a she-donkey, sire unknown. At the time of writing she was giving milk, and the foal suckled in the presence of the veterinary surgeon, who was able to certify that both mule and foal were genuine.



“Tropical Life” Friend.—No. 101.

MR. E. J. F. CAMPBELL, F.R.H.S.

Superintendent Botanic Station, British Honduras.

WE have noted with pleasure of late that TROPICAL LIFE is not the only paper by any means that believes in the undeveloped possibilities stowed away in our Central-American colony of British Honduras, possibilities that only await knowledge, enterprise and capital to convert them into actualities, and very remunerative ones too. Among other papers, *The Field* (London), some little time back, rightly claimed that British Honduras offers plenty of scope for the tropical agriculturist, since the country is capable of producing cacao, tobacco, rice, coffee, kola, coca, also rubber (as we showed, with illustration, in our August issue, p. 149), and—be it not forgotten—also coco-nuts. All that is wanted are Capital and Labour—important items no doubt, but still, these will probably soon be found, the labour especially, now that the last quarter-mile of dyke has been blown out at Gatun, and the Pacific has met the Atlantic through the completed channel of the Panama Canal. Out of the 50,000 or 60,000 employees that the completion of the Canal will let loose, some 30,000 were, we believe, West Indian negroes, or men of that type. A good proportion of such an army, once the capital is forthcoming, would do well if induced to open up British Honduras, and take a share of the agricultural riches that will be theirs, if they show the same power to plod and persevere that everyone must have possessed, from Colonel Goethals downwards, to have completed the Canal at all, and especially along the lines that the work has been carried through.

Among other possibilities that British Honduras offers for capitalists, the successful exploitation of the Cohune nut must take a prominent place, for we are

told that the palms, which grow there indigenously, are so numerous that the nuts, so says rumour, can be picked up by the hundred and thousand ton lot at a time, including the shell, which accounts, we fear, for the bulk of the 20 cwt. that go to make up each ton. Owing to this thickness of the shell, the successful exploitation of the produce of the *Attalea Cohune* palm is, like the nut itself, a hard, and all but (up to now) a baffling nut to crack, but once that difficulty is overcome a great future lies before it. In that case, no more reliable authority on the Cohune exists in British Honduras than “Our Friend” this month.

This is not to be wondered at when one considers the time—seventeen years—which has elapsed since Mr. Campbell was appointed Superintendent of the Station at Honduras; careful student that we have always found him to be of the land and forests under his charge, we should imagine that Quasimodo, Victor Hugo’s hero, hardly knew Notre Dame better than Mr. Campbell has come to know the forests under his charge, in which the Cohune nuts abound in British Honduras.

“I am glad to think that you sometimes remember this good old colony,” wrote Mr. Campbell, when acknowledging receipt of our August issue; “it is well worthy of attention, and I am prepared to prove that there is no better centre in which to invest capital in lands and agricultural enterprises than here in British Honduras, but the work must be carried through thoroughly. Once you have the land all right there is no better field for producing coco-nuts, rubber and cacao, and I will certainly do my part to help anyone to succeed. In the Stann Creek District, where the new Government railway recently started to open up the fertile interior land, the whole of it is exceedingly suitable for cacao, whilst the virgin soil produces bananas of remarkable quality. Both these crops, therefore, would do well up there. Along the line the United States Fruit Company has established banana plantations, leaving others to plant cacao. If your friends would visit the colony they would be ready to buy lands.” Such a letter betokens a willing optimist that it would be pleasant to meet.

So far as we can remember, Mr. Campbell has had a thorough training and under good masters. These include Sir Daniel Morris in Jamaica, under whom, as well as under the late Mr. Hinchley Hart, “Our Friend” worked until about 1886 as assistant in the Government Cinchona Plantations; from 1886 to 1888 he was Acting-Superintendent of Hope Gardens, Jamaica, and then, until 1890, became Superintendent of the King’s House (Government House) Gardens, retiring from that to serve as Acting-Superintendent of Castlelon Gardens, which post he held until 1894, when he again took over the duties of Superintendent of the King’s House Gardens for another two years. Mr. Campbell then left Jamaica, after over fifteen years’ service in that Island, on being appointed Superintendent of the Botanic Station at Belize, British Honduras, whither he proceeded in 1896, and has remained there ever since.

To most of our readers British Honduras has, perhaps, been best known hitherto as a mahogany centre. With the labour let loose from Panama we hope now to hear more of this colony as a producer of cacao, fruit, vegetable oils, &c., as Costa Rica has become.

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all enquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

NOVEMBER, 1913.

Why Raw Rubber Keeps Low.

No wonder that the public complain of manufactured rubber goods, especially tyres, being unnecessarily high on the one hand, and the price of the raw material being needlessly low on the other. Buyers of rubber tyres, whether motor manufacturers on this side or managers of rubber estates where salaries are being lowered, and other users of tyres, &c., abroad, should note the following figures and boycott those firms which persist in charging exorbitant rates for their manufactured rubber goods, whether tyres or anything else, the first because such prices curtail demand and discourage sales, and the latter because they are put to an unnecessary expense in proportion to their incomes.

The Dunlop Rubber Company, in a recent prospectus inviting the public to subscribe further capital, show that, after paying their directors' fees, the salaries of their staff, &c., the Company's net revenue, during the past nine years only, and exclusive of premiums on Ordinary shares, likewise after deducting all interest and other charges ranking before the Preference dividend, and therefore in truth a veritable net revenue, amounted to no less a sum than £2,174,718 1s. 2d., or an average net revenue of £241,635 6s. 9d. per annum; this year (ending August 31st) establishing the record with nearly 50 per cent. above the average profit, since it shows £350,356 0s. 8d., just when many producers are most anxious to even pay their way, or, taking the plantation industry as a whole, to make a fair profit instead of none at all.

No wonder, therefore, that buyers complain of the continued high cost of the manufactured article, when the price of the raw material has fallen from 12s. to 2s. per lb., so that, as shareholders in

the rubber companies their dividends are seriously reduced or non-existent, whilst the future to the greatest optimist among them is anything but rosy. To gain profits like the above, the price of the goods must be, as the public complain of,* unnecessarily high, and the purchase and consumption of rubber goods seriously discouraged and curtailed, and through that the demand for the raw rubber restricted. This naturally causes the prices realized, owing to lack of strenuous competition, to be pulled down lower and lower whilst the public benefit neither as buyers nor sellers. At a period like the present when most folks, who wish the plantation industry well, are striving to extend and increase the uses rubber can be put to, we cannot but regret that those uses to which rubber has already been put should thus be curtailed instead of extended in comparison to the fall in the price of the raw material. Unless a change takes place we should suggest that instead of financing rubber-holders to enable them to keep up prices the plantation shareholders should combine and utilize the two-million trust, one correspondent spoke of, in manufacturing high-class rubber goods and sell them to the public at a fair margin of profit, based on the cost of the raw material only, and without having to include goodwill, company promoters' profits, &c. In a word, to keep down the price of the manufactured article, thereby increasing the demand, and through that stimulating the competition for raw rubber, and thus raising and maintaining its price to a fair level to the producers.

The Tropics and Tropical Medicine.

LEADING AUTHORITIES REMINISCE AND REVIEW.

FRIDAY evening, October 24th, found about one hundred and thirty men assembled in the large Picture Salon of Prince's well-known restaurant in Piccadilly, to celebrate the triumphal progress made by the London School of Tropical Medicine during the last twelve months, to congratulate Mr. Austen Chamberlain, Sir Patrick Manson, Mr. Michelli, and others on the success of their appeal, and hear how the £70,000 and a little more received, was to be expended; at the same time the opportunity was taken to present Sir Patrick Manson with his portrait in oils. This was done by Mr. Cantlie, speaking for London, and Dr. Prout, speaking for Liverpool, whilst the kindest and most courteous of medical men, Dr. Sandwith, told us, as Chairman, a little about the London School and the work it was doing, what it meant to do in the future, and had done in the past.

The occasion chosen for doing all this was the annual students' dinner of the London School, when, among those present besides the above mentioned, we noticed Lord Milner, Sir John Anderson, Permanent Under-Secretary for the Colonies (whom we hope to see as keen on securing Agricultural Colleges in the Tropics as he is a School of Tropical Medicine in London), all of whom spoke; then there were Dr. Daniels (who has been appointed to take Sir Patrick Manson's place as medical adviser to the Colonial Office, on which appointment congratulations are equally due to Dr.

* See, for instance TROPICAL LIFE for July, p. 128, quoting complaints in the London Press.

Daniels and the Colonial Office—the first on being chosen, the latter on securing so able an authority); Mr. Arthur Lampard, not unknown to rubber men; Mr. C. C. McLeod, the tea magnate; Mr. A. E. Aspinall, Editor of the *West India Committee Circular*, who, with Mr. McLeod and Mr. G. Croll, was congratulated and thanked by Mr. Chamberlain for his help; Sir William Treacher, and many other shining lights in the tropical world, making in the aggregate a representative and influential gathering of those who are devoting their time and energy to developing the Tropics along the best lines possible, to make them a benefit to, and the friend of all, and no longer the enemy of any man—or woman.

Want of space forces us reluctantly to cut out the speeches, for they were able and instructive, but we cannot omit the following particulars given by Mr. Chamberlain, Chairman of the Appeal Committee, as to what he and his colleagues have agreed to do with the amount received in reply to his appeal. “We set out to obtain £100,000,” he told us—for the Editor of *TROPICAL LIFE* was sitting near by, next to Mr. C. T. Orford, a member of the Hospital Committee—“and have so far received the not inconsiderable sum of over £70,000.”* Of this amount a portion, that will have to be augmented when the overseas contributions come in,† has been expended on larger premises, laboratories, &c., but more should be and must be done in this way if London is to compare with Paris and its Pasteur Institute. A second amount has been allocated to provide a fund for research work and to strengthen their staff to carry out such work. This is, in our opinion, the most important object to strive after if we want to assure success in treating tropical diseases at the present stage, when, quoting Mr. Cantlie’s speech (and on account of his experience and as Editor of *The Journal of Tropical Medicine and Hygiene* his remarks bear great weight), “we have still done little more than scratched the surface.” Then there was the endowment for the school, inadequately moderate so far, but immensely appreciated as being the means to place it beyond immediate wants. Last, but not least, we come to an object of some delicacy, but with which all sympathize and show approval. “Men sometimes returned from the Tropics,” Mr. Chamberlain told those present, “suffering from tropical diseases of which the local practitioner has not had experience, and with insufficient means to secure the attention of those with that special knowledge of tropical diseases which is confined to very few men. For such cases—perhaps civil servants on low rates of pay, or employees of companies engaged in tropical trade, requiring this special care in special hospitals—they had, through the kindness and co-operation of the authorities of the Seamen’s Hospital, been able to make arrangements by which the sufferers should be able to receive the best treatment.”

The above, therefore, is a very curtailed account of what Mr. Chamberlain and his colleagues have done with £70,000 entrusted to their care. Can anyone quibble at the way in which it has been distributed to benefit the Tropics, and are there not a large number

of well-to-do planters and merchants, estate managers, overseers, and others who do not now feel sorry, and perhaps ashamed that their donations were not sent over to swell the amount? There must be, we know, a large number. Fortunately there is still time to “make good”; so we hope one and all will hasten to remedy their omissions and likewise subscribe to the fund, for after all they alone are the ones who will directly benefit, not those who have raised the £70,000 over here.

The Imprisonment of Europeans in the Tropics.

WHETHER the sentence of three years’ imprisonment passed on a young European—he was only aged 25—in charge of an estate in Ceylon is excessive, as the local papers seem to think it is, or not, the matter of imprisoning Europeans, and especially first offenders, whom no one pretends are dangerous or hardened criminals, has again been brought prominently forward. Those who, like ourselves, have taken an interest in prison reform, not from sentimental reasons, but to secure for the public an increased value for the money they spend on trying to reclaim wrongdoers, cannot fail to realize what a sentence of penal servitude, or rigorous punishment, must mean to the ordinary European in the Tropics. The old prison in the Chaguanas woods, or the convict depôt on Carrara Island in Trinidad, W.I., never did appeal to us as being suitable places of detention for Europeans, neither do those in other centres which we know of only by hearsay. If you want to kill the man, then send him to these prisons. One of our black servants, who was legally but not morally wrong, was polished off before half his sentence was completed, and, at the time, we considered that the system alone was to blame. If it is so with the native, what must it be for a European? In the Ceylon case mentioned the Englishman has been sentenced to three years’ hard labour; in carrying out the sentence, does the local or home Government guarantee to keep the boy—or very little more than a boy—in an equal degree of health to what he would enjoy (?) in an English jail? Whatever guarantee they give, we would rather be here in prison than in the Tropics, though we trust we may never be in either. “The climate” (in Ceylon, writes Y. Y., in the *Times of Ceylon*) “is not healthy, and (the Europeans in the prison) at the end of their sentences will be old before their time, broken in health and spirit.” As already stated, we are not calling attention to the matter from a sentimental point of view, but because we want to do what is best and right, both to the prisoner and the public. If the imprisonment is more than the man can stand, then the sentence is unfair to the prisoner; if it breaks down his self-respect and turns him out useless, if not dangerous, then the sentence is still more unfair to the public. There is a tendency in imprisoning Europeans in most, if not all, tropical jails of being unfair to public and prisoner alike unless we are careful. Let us therefore see to it that we are over, rather than under, cautious in these matters to avoid this tendency, with the very few occasions on which it is necessary to punish Europeans severely in the Tropics.

* Causing us to feel ashamed that our readers had not done their share by subscribing £25,000, so as to bring the total up to £100,000, or nearly.

† These and other comments are ours, not Mr. Chamberlain’s.

The "Nasicornus Beetle" Fungus.

AN ENEMY OF THE COCO-NUT BEETLE.

OUR friend, Mr. H. J. Moors, of Samoa, wrote us on September 20th that a parasite that fed on the larvæ of coco-nut beetles had been discovered in Samoa, to which it was indigenous. Whether the fungus can be successfully transported to other centres to wage war on beetle larvæ remains to be seen, but the matter is worthy of the closest attention, and we are much indebted to Mr. Moors for having called our attention to so valuable a discovery.

Many months ago, he tells us, Dr. Friederichs, Government Entomologist in Samoa, discovered that occasionally he would find a beetle larva with one or more small brown spots on its back. Observations showed that these larvæ were attacked by a natural fungus, native of Samoa, and that it fatally injured the insect. Experiments, therefore, are being carried out to further so desirable an end. Many beetle larvæ were captured and confined in boxes and old kerosene tins mixed up with plenty of rotting wood and cacao shells, and the effect of the fungus was watched very carefully after it had been placed in the boxes. For months the result was very unsatisfactory, only few of the exposed larvæ being attacked. When Professor Doane, of the Leland Stanford University, was here, he also carried on a series of experiments with this fungus, and his best results also were far from satisfactory; probably, by continually feeding larvæ to this fungus, it has now become so voracious that when placed in a box containing the larvæ it will attack and eat almost every one of them. It has therefore been introduced into artificial breeding-nests made in the open for the mother beetles, and is destroying the larvæ as fast as they appear. Planters are now building nests, spaced about one to each acre, all over their coco-nut plantations, and beyond them on every side, and great relief is expected. The Administration of Samoa is also putting in these nests in many places, spaced about 120 paces apart. Of course, it is necessary to clear up the adjacent country so that there will be no natural breeding-places for the beetles to discover.

The nests made in Samoa, and recommended by Dr. Friederichs, consist of a low frail stone wall about 15 in. high and about 6 ft. across the top from side to side. The well-like opening is to be filled with rotting husks, old coco-nut wood, other rotting wood, and, if possible, three or more bags of cacao husks fresh from the breaking. The whole is covered with 4 in. or 5 in. of soft earth kept well weeded, and then a few handfuls of the fungus-infected earth is scattered over the top, and covered from the hot sun several days until it penetrates to the refuse underneath. The smell of the fermenting cacao pods, or of the rotting wood, attracts the mother beetles, who come in great numbers to oviposit, and the fungus destroys the larvæ almost as fast as they come forth from the eggs. He concludes: "I have talked with the assistants of Dr. Friederichs, and with planters who are experimenting under his observation, and I have seen the dead and dying larvæ removed from the nests, and noted that the destruction is from 90 to 100 per cent. effective.

"I have heard that mother beetles who remain long in these nests are also affected, and leave only to find

themselves suffering from the fungus cancer. I have seen here a trap about 30 in. by 60 in. in size constructed of wood, wire netting and galvanized iron, and costing, say, 12s. to 15s. to make, which is said to have caught 460 beetles within three months' time. It is baited with live beetles, whose calls or odour attract their friends and relatives. Dr. Friederichs deserves great credit for his patience and scientific attainments, which must prove of the greatest use to planters."

The following appeared in the *Samoaansche Zeitung* of September 13th (in German) in connection with this parasite:—

The Plant Pathologist, Dr. Friederichs, has reported to the Imperial Governor as follows:—

"I have the honour to state to Your Excellency that, at the Vaitele Plantation, according to the opinion of the manager, Herr Eberhardt, complete success has been attained by the use of the *Nasicornus* beetle fungus. I must leave it undecided whether it will be a permanent success or not, but the present condition of the experiments appears, as a matter of fact, to be highly satisfactory.

"Herr Eberhardt has, with exemplary energy and care, carried out, in a very brief space of time, the measures proposed to combat the beetle by means of the fungus.

"In February last he received from the pathological laboratory 1 cwt. of fungus-infected earth, and at once formed a trap heap ('tumu') near the seashore of the plantation; then, after more of the material was infected, he set up two others on April 3rd, and five more on April 30th.

"Out of about 150 trap heaps, which had been previously placed in the same part of the plantation (these had been placed at distances from one another of perhaps 330 ft.), forty were thus, from time to time, caused to be infected, just in those parts of the plantation where the activity of the beetle had specially made its presence known.

"As early as July last there were found in the same part of the plantation (in non-infected trap heaps and in other places) amongst the collected grubs about 30 per cent. of sick or dead ones killed by the fungus. That means, in reality, a larger percentage of destruction than the above, as the sickness acts rapidly, and the dead bodies soon crumble to pieces and are carried away by the ants.

"It is also worthy of note that this month, August, the men collecting beetles have found difficulty everywhere in that part of the plantation just mentioned, to obtain any full-grown larvæ. Not, indeed, that they had totally disappeared; but those found were all small, *i.e.*, a few days old. The older the larvæ the more easily they are infected by the fungus.

"At present the labourers specially collect the beetles in the vicinity of the plantation, and already find numerous sick larvæ there. On the west boundary, towards the village of Saina, more diseased grubs were found than along the east boundary, towards Vaiusu. This agrees with the prevailing east winds, which the beetle follows, spreading the spores.

"Amongst 193 larvæ, collected for the most part beyond the Saina boundary, I found twenty-four sick ones. The disease is already beginning to gain a firm footing there.

"The spreading of the disease in Vaitele took place

in the dry season, certainly in a rather moist dry season; therefore how much greater a result we may expect in the rainy months remains to be seen. The great moisture of the air prevailing in Samoa throughout the whole year favours very considerably the effect of the fungus. Undoubtedly excellent results have been obtained, and this success should incite us to set up infected trap heaps everywhere. To do this, however, the assistance of all the planters is needed, and some of them have already begun to render it.

"Should we succeed in transplanting this fungus all over the country, then we may hope that within two years the beetle pest will assume a very different aspect to that which it offers at present."

Biao Nut, Tung or Wood Oil.

MR. A. W. PRAUTCH writes as follows in the *Mindanao Herald*, and with the need of distributing the risks, financial and otherwise, on an estate, his remarks are worth noting:—

"The tree which produces the biao nut is known botanically as *Aleurites moluccana* or *Aleurites triloba*. In Luzon it is known as Lumbang or Lubang, and in Hawaii as Kukui.

"This nut produces an oil which is much sought for by varnish manufacturers for its transparency and quick drying and non-cracking qualities. Although this nut has been bought in limited quantities by traders in various provinces of the Philippines for centuries, there is no information available of the yield of nuts per tree, per year, nor the yield of oil per picul of nuts, nor any other data other than statistics of quantities shipped.

"There is an exportation from China to the United States of five million gallons of 'tung oil' for varnish making annually. I know that this is *Aleurites fordii*, but I do not know in what that oil differs from our *Aleurites triloba*. However, as our biao oil is sought for by the United States varnish makers I am justified in assuming that it is in the same class as tung oil, and the business is important enough to warrant a thorough examination.

"I was surprised by an article in the *Technical World Magazine* for July, 1913, explaining that the United States Department of Agriculture had been experimenting for years with tung oil trees in South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Florida, and California, and were so well satisfied with results that they had sufficient seedlings on hand to give farmers enough to plant up an acre.

"In view of the fact that tung varnish trees are considered worth planting in the United States, it is certainly good sense for us to post up on biao varnish oil. The article mentioned states that the yield of tung oil nuts in China is from 30 to 75 lb. to the tree. The oil from the nuts constitutes nearly 25 per cent. of their substance, and at the present price of the oil the nuts are worth about 24 centavos a pound (biao at P13.30* a picul would only be 10 centavos per lb.). One eight-year-old tree near Tallahassee, Florida, bore two bushels of fruit last year. 'The present consumption of tung oil in the United States would require about forty thousand acres of orchards,

and the Department of Agriculture points out that the industry may expand into several times this consumption.'

"My attention was directed to biao some three years ago by letters written to the Manila Bureau of Science by three or four varnish manufacturers in America, asking for the addresses of merchants who could furnish a constant supply of biao oil of which they had secured a small shipment, but could buy no more. I published these letters in the *Manila Times*.

"When at Lebak I had opportunity to learn about biao in Cotabato and Sarangani, and I experimented in planting out several hundred seedlings. I found that the hogs did not attack them and that they grew well—being soft wood it is naturally a quick grower.

"While in Manila in July, 1913, I got what information was available. The Manila Match Factory last year bought 600 freight car loads of biao logs to make matches from Laguna Province alone. I hope this economic blunder will not be repeated.

"There is a modern oil mill at Cotabato owned by the Rio Grande Rubber Co. They will buy all biao available at highest market price.

"There are four biao oil mills in Manila owned by Chinese. These are antiquated, hollow logs in which pressure is secured by driving wedges. They only work part of the time, because at times they have no biao nuts, and at other times they have an unsold stock of oil on hand. Asked why they do not export oil, they said that foreign merchants had sent away samples of oil and asked them to contract to supply 5,000 gallons or more. This they could not do because they were not sure of the supply of nuts. When asked why they did not contract with the people for a steady and large supply of nuts, they replied, 'Our presses could not handle them, nor would we be sure of selling the oil, as the local demand for oil is limited to its use for making soap, mixing paint, and on building boats.' When asked why they did not instal modern presses they said they were not sure of the supply of nuts, nor sure of the sale of larger quantities of oil, &c. The whole affair is entirely disconnected, unorganized, and largely undeveloped.

"I believe that long ago coco-nuts grew at haphazard, but when they became of commercial worth they were planted in groves near houses to facilitate the gathering of the nuts. I think there is nothing wrong with applying this same rule to biao, and with the example of the United States Department of Agriculture, having experimented for eight years and being satisfied they are right, I can see no harm in developing a natural resource which a benevolent Providence has bestowed upon an unappreciative people."

Since giving out the above for publication we received the last issue of the *Bulletin of the Imperial Institute*, noticed elsewhere, in which, on pp. 441-461, under the heading of "Special Articles," we were pleased to find a detailed description of the *Aleurites* or "wood-oil" trees of China and Japan, accompanied with five illustrations showing (1) the *A. fordii* in blossom; (2) an *A. fordii* tree full grown, i.e., about 8 metres, or 26 ft., high by nearly 20 ft. across; (3) a grove of these trees at the leafless stage, in marked contrast to the full leaved one in illustration No. 2; (4) wedge press for extracting the oil, and fruit and seeds, natural size, of *A. fordii*; (5) fruits of (a) *A. montana*, (b) *A. fordii*, (c) *A. cordata*. The article

* P = 2s. 0½d.

concludes with a list of the principal references made use of. The list itself is worthy of careful note.

Having already given up so much space to the subject, we can only urge our readers to study this article, which concludes with the following:—

“In any attempt to establish new industries, particularly those of an agricultural character, the question of labour and its cost is of primary importance. In China labour is notoriously cheap. . . . Since the demand for these oils will undoubtedly increase, it would appear essential that the source of supply be extended. . . . The object of this article is to give the facts concerning Chinese wood-oils and the trees yielding them. It is for the various departments of agriculture in the warm-temperate and sub-tropical parts of the world to weigh with professional acumen the *pros* and *cons* as to the advisability or otherwise of attempting . . . the experimental culture of the trees yielding Chinese wood-oil.

Samoan News.

By A SAMOAN CORRESPONDENT.

THE losses from cacao canker in Samoa were severe in 1912-1913, and but small progress has been made in effectively fighting this scourge, so that we shall be glad to have your latest information on this, to us, vital subject. Meanwhile, in order to keep the pest back, many of us are lime-washing our trees, and this, at first, did seem to protect them, and in places render them immune whilst canker was raging all about; but during the extremely wet season this year it took a fresh start and invaded a fairly well lime-washed plantation, killing out about 300 trees that were thought to be safely covered against the canker. We have, therefore, added sulphur to the quicklime we have been using, and are watching for results. We also use (we think successfully) expended carbide refuse as a bark wash.

Our trees bear phenomenally without manure until they are eight years old, after which some of us help them out with about $1\frac{1}{2}$ lb. sulphate of potash and 4 lb. coral sand mixed together, and put on once a year before the rains set in. We find that well-tended trees will yield from 5 to 8 lb. cured cacao beans, so that we have acreages here which yield easily 6 cwt. of dried beans of best quality, and we even have instances of yields running up to 14 cwt. from a single acre. But yields up to 7 cwt. are frequently found over a good-sized estate. The trees are planted from 12×12 up to 18×18 , but $16\frac{1}{2} \times 16\frac{1}{2}$ ft. seems, to the writer, to give best results. As has been discovered elsewhere, the Forastero variety seems a hardier tree than the Criollo, and bears more fruit, it is also less subject to canker.

We have also had trouble, as you know, with the coco-nuts; this caused several of us to club together and apply to Professor David Starr Jordan, of the Stanford University at Palo Alto, for help, and he sent Professor Doane, of that institution, to study up the Rhino Beetle for us, but as his stay was limited to the length of his vacation, he was unable to accomplish much. He has gone back to the College, and doubtless will continue to actively interest himself in us. When Stanford gets its teeth in, it takes a good grip, and we still look for results from Professor Doane's visit.

“Tropical Life” at the Play.

SOUVENIRS of our school days recall the remark of a boy who, on cutting the cake in his tuck-basket, said that it was no end of good, but the cook must have stood on a hill three miles off and thrown the currants into the basin, or, at least, tried to do so, and missed most times. A visit to see Mr. Weedon Grossmith in “The New Duke” at the Comedy Theatre reminded us of our old school chum and his currants; what there was of the play was “no end of good” when you encountered it, but to spin it out from 9 to 11, by the help of long intervals, when it could have been smartly acted in about an hour, seemed to us a mistake. When the curtain was up, however, the house laughed—good, honest, spontaneous laughter—at times it seemed to rock with it. The appearance of the Eugenic Twins was a sight not to be forgotten in a hurry, especially with Miss Mary Brough as the Dowager Duchess (who did not believe in eugenic marriages between dukes and yokels, simply because the bride's measurements were correct) standing in the background and watching the procession file through the room. Certainly Mr. Weedon Grossmith as the Duke, and Miss Dorothy Drake as the Eugenic Duchess, to say nothing of the twins, their nurses, and the other folks, are worthy of a visit.

There was no curtain raiser, but four ladies discoursed sweet music, among them Miss Marjorie Samuel, who appealed to us as being a really clever pianist and accompanist. They were followed by a weirdly clever club-manipulator in the person of Mr. J. H. Leolin, who helped to pass the time; but why make those who go to see plays spend half the time watching a variety entertainment. Is there such a dearth of attractive plays as some claim? Is there nothing left in London to write plays about? Are the public all leading as empty-headed and freakish lives as their costumes and behaviour in the streets and at social gatherings would lead you to believe? If so, why do not some of the playwrights go and pick up plots in the Tropics, where they abound by the thousand from the palaces of the Viceroys and Governors down to the tapia huts of the Indians. A glance at the weekly edition of a paper like the *Madras Mail* would soon prove the correctness of this statement, especially if you sit down with an “old hand” who can tell you the past history behind the characters in the news. Frontier and tribal wars, punitive expeditions, international political intrigues, tiger-shooting and big-game expeditions, with their tragic deaths (to get rid of the villains) and marvellous escapes (of the hero and heroines), fortunes made and lost in commerce, agriculture and mining. Elsewhere the unrest in Java, the turmoil in Mexico, the horrors in Peru (where the hero, as a medical missionary, makes all come right); or else sit up in a Latin-American village for a month or two and listen to the tales and watch the life, or if none of the above are any good there are others, plenty of others—if the playwrights will only go and look for them.

All the same, “The New Duke” is really funny, and Miss Samuel can play the piano.

Cotton.

THE following were the prices for Cotton in London on November 6th, according to Messrs. Slann and Davies :—

Davies :—																		
Compare																		
Good—Fair.																		
Good.																		
Fine.																		
Superfine.																		
Good, 1912.																		
Good, 1911.																		
per lb.																		
d. d. d. d. d. d. d. d. d. d. d. d. d.																		
Surat kinds*	...	6 $\frac{1}{8}$	to	6 $\frac{7}{8}$	6 $\frac{5}{8}$	to	6 $\frac{3}{4}$	6 $\frac{9}{16}$	to	7 $\frac{1}{16}$	—	5 $\frac{1}{8}$	to	6	4 $\frac{3}{4}$	to	4 $\frac{7}{8}$	—
Madras	...	6 $\frac{3}{4}$	to	6 $\frac{7}{8}$	6 $\frac{1}{4}$	to	7 $\frac{1}{8}$	—	—	—	—	5 $\frac{1}{4}$	to	6 $\frac{1}{4}$	4 $\frac{5}{8}$	to	5 $\frac{3}{16}$	—
Bengal	...	—	—	—	5 $\frac{3}{4}$	—	—	6	—	6 $\frac{1}{8}$	—	5 $\frac{3}{8}$	—	—	4 $\frac{5}{16}$	—	—	—
Assam	...	—	—	—	6	—	—	6 $\frac{3}{8}$	—	6 $\frac{5}{8}$	—	5 $\frac{3}{4}$	—	—	4 $\frac{2}{8}$	—	—	—
China	...	—	—	—	6 $\frac{1}{8}$	—	—	6 $\frac{7}{16}$	—	6 $\frac{11}{16}$	—	5 $\frac{3}{4}$	—	—	5 $\frac{1}{16}$	—	—	—
West Indian	...	7 $\frac{1}{4}$	—	—	7 $\frac{3}{4}$	—	—	8 $\frac{1}{4}$	—	8 $\frac{1}{2}$	—	7 $\frac{1}{2}$	—	—	7	—	—	—
Sea Island	...	12 $\frac{1}{2}$	—	—	15	—	—	18 $\frac{1}{2}$	—	22	—	14 $\frac{1}{2}$	—	—	13 $\frac{1}{2}$	—	—	—
West African	...	7 $\frac{5}{16}$	—	—	7 $\frac{9}{16}$	—	—	7 $\frac{5}{16}$	—	—	—	6 $\frac{5}{8}$	—	—	5 $\frac{3}{16}$	—	—	—
East	„	7 $\frac{1}{2}$	—	—	8 $\frac{3}{8}$	—	—	10 $\frac{1}{8}$	—	—	—	7 $\frac{7}{8}$	—	—	6 $\frac{5}{16}$	—	—	—

* Liverpool quotations.

While spot purchases have been rather larger than for some weeks past, the "Future" market has been very idle. Trade generally is held in check by fears of armed intervention in Mexico and financial difficulties of Indian native banks and traders. Deliveries close 9 to 4 $\frac{1}{2}$ points down on the week. Very little business is passing in Indian Cotton, which is lower, and pressed for sale. Silver is quoted at 27 $\frac{1}{16}$ d. per oz.

The import into Liverpool this week amounted to 167,552 bales, since September 1st 863,452, same week last year 121,382, last year's total 878,049 bales. The estimated Sales amount to 66,000 bales, including "called." Middling American is quoted at 7.63d. per lb., last year 6.78d., 1911, 5.13d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight ...	4,537,000	4,362,000	4,390,000	bales
Exports from United States since September 1st—				
To Great Britain ...	844,000	1,063,000	1,136,000	—
To Continent, &c. ...	1,445,000	1,288,000	1,318,000	—
Total crop ...	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	November 6th.	Same time 1912.	Same time 1911.	
November ...	7.29	6.60	4.98	per lb.
Nov.—Dec. ...	7.18	6.48	4.89	—
Dec.—Jan. ...	7.15 $\frac{1}{2}$	6.46	4.89	—

Sugar.

SINCE last week the market has been very quiet indeed, wrote Messrs. C. Czarnikow, Ltd., on November 6th, at prices receding slowly from 9s. 11 $\frac{1}{2}$ d. May to 9s. 9 $\frac{3}{4}$ d. and closing at 9s. 9 $\frac{1}{2}$ d. There is no special reason given, except that the weather was very fair, rather warm for roots harvested, but benefiting the limited quantity still in the ground, whilst for keeping up or improving the quality cooler temperatures would be welcome. The consumers' demand was likewise rather languid, both for raw and refined, low water in the Elbe and sandbanks near Hamburg interfered with arrivals there, and, as shown by weekly Customs figures, less sugar in October than last year must have entered into consumption, or rather into deliveries here, whatever may have been the case in Convention countries. The American market moved from 3.54 to 3.61 to 3.54 cents for prompt, whilst January-February cargoes are held too high for us at 10s. 4 $\frac{1}{2}$ d. c.i.f. United Kingdom, but the movement did not affect us much, though at times our market seems absolutely swayed only by Cuban quotations and Cuban weather, Cuban prospects, in fact Cuban everything, the 5 $\frac{3}{4}$ million tons in Europe and their distribution being hardly talked about.

In the United Kingdom, business in refining grades has been almost at a standstill, but values remain about unchanged. Grocery Crystallized at auction sold in small quantities at rather easier rates.

From cane-producing countries there is not much fresh news. The Cape mail reports that the position in Natal is improved, rains having fallen, which will be beneficial to the canes, though more is required.

British West India.—The total transactions for the week amount to about 4,000 bags. Crystallized Demerara, fine yellow, 15s. 9d. duty paid. Crystallized Trinidad, low brownish yellow, 14s.; good palish and good middling yellow, 14s. 6d. to 14s. 9d. Crystallized St. Lucia, middling greyish and yellow, 14s.; good middling yellow, 14s. 4 $\frac{1}{2}$ d. to 14s. 9d. Syrups (455 bags), middling soft yellow, 11s. 3d. Antigua Syrups (90 bags), good middling soft yellow, 12s. 6d.

In Liverpool about 500 tons Peruvian Syrups sold at 8s. 10 $\frac{1}{2}$ d. floating, landing, Clyde, basis 89 per cent.

The American market further advanced at the close of last week from 3.54 to 3.61, relapsing yesterday, probably owing to better reports from Cuba, to 3.54 cents = 10s. c.i.f. New York for Cubas or 10s. 4 $\frac{1}{2}$ d. c.i.f. United Kingdom. The landings in the three ports for the week were 12,000 tons, and meltings 28,000 tons, reducing stocks to 130,000 tons.

The India-rubber Market.

UP at Liverpool the Pará market has been quiet, and no sales have been reported here. The closing tone is rather firmer, and values are: Hard fine spot, 3s. 2½d.; November, 3s. 2d.; December, 3s. 0¾d.; soft fine, November, 2s. 10d.; Peruvian Ball, 1s. 10½d.; and scrappy Negroheads, 1s. 11½d. per lb. Medium Brazilian grades have been quiet and unchanged; good quality Manicoba sold at 1s. 6d., and Ceará Negroheads at 1s. 5d. per lb. The African market has been very steady, and the sales reported amount to 30 tons, including Rio Nunez niggers, 2s. 2d.; Loango ball, 1s. 6d.; large Lahou niggers, 1s. 6d.; selected Lagos lump, 1s. 3d.; large Lahou cake, 1s. 3d.; selected Gold and/or Ivory Coast lump, 1s. 1d. to 1s. 1½d.; ditto rejections, 1s.; Accra paste, 9d. to 9½d.; and Niger flake, 9d. per lb.

The sales in London are on as we go to press; this prevents our giving Messrs. S. Figgis and Co.'s usual report. Meanwhile the Plantation market privately has been firmer, owing to a good demand, and a good business has been done in all positions at dearer rates. Standard No. 1 Crêpe sold at 2s. 1¾d. to 2s. 2¾d. for spot; November-December at 2s. 1¾d. to 2s. 2¾d.; whilst smoked sheet on the spot realized 2s. 5d. to 2s. 5½d., November delivery at 2s. 5¼d.

At the sales on November 4th and 5th about 960 tons were offered, which met with rather a slow demand at the start, but fully private rates were realized, prices being about ½d. better than the average of the previous sales for Crêpe, whilst smoked sheet was unchanged. As the sale progressed, prices were barely maintained, and in the case of smoked sheet ½d. decline was established. Afterwards, however, the demand improved, and rates recovered to the opening parity for Crêpe, smoked sheet remaining steady. On the second day competition was much more animated, and better prices were paid all round, the final result being an average advance of ½d. per lb. for Crêpe of all grades, and unchanged for smoked sheet as compared with a fortnight ago when we issued our October report.

Sales included:—

Plantation Malay.—Smoked sheet, fair to fine, sold at 2s. 3¾d. to 2s. 5¼d., with "Highlands" at 2s. 6¼d. to 2s. 7¼d.; partly smoked, damp, and mouldy at 2s. to 2s. 3½d. Unsmoked, fair to fine, 2s. 1½d. to 2s. 2¼d.; damp, part mouldy, and stuck at 1s. 11d. to 2s. 1¾d. Pale Lanadron block at 2s. 1½d. Crêpe, fair to fine pale and palish part thick gristly at 2s. 1½d. to 2s. 2¾d.; light brown and grey, part streaky, at 2s. 0½d. to 2s. 2d.; fair to good clean brown at 1s. 10d. to 2s. 1½d.; dark brown and specky at 1s. 6¼d. to 1s. 10¾d.; black and soft, part pressed, at 1s. 6¾d. to 1s. 10½d.; inferior, 1s. 5d. to 1s. 6¼d. Smoked, dark to good, at 1s. 8d. to 2s. 1½d.; cured by "Byrne" process at 1s. 8¾d. to 2s. 4¼d. Scrap and Virgin, fair to good, at 1s. 4d. to 1s. 7½d.; mixed and inferior at 11d. to 1s. 2d. Ceará sheet and block at 1s. 7½d. to 1s. 10d. Rambong, Crêpe at 1s. 11¼d. to 2s. 0¼d.; scrap and block at 1s. 8d. to 1s. 9d. Ceará sheet at 1s. 7½d. to 2s. 1d.

Ceylon.—Smoked sheet, fair to good, at 2s. 4d. to 2s. 5¼d.; partly smoked, damp, and mouldy at 2s. 3d. to 2s. 3¾d. Unsmoked sheet and biscuits, fair to good, at 2s. 1½d. to 2s. 2¼d.; damp, mouldy, and stuck at

1s. 11¾d. to 2s. 1½d. Crêpe, dullish to fine thick gristly at 2s. 1½d. to 2s. 2½d.; very fine at 2s. 2¾d. to 2s. 3½d.; dullish to fine pale and palish at 2s. 1¼d. to 2s. 2½d.; light brown and gray, part streaky, at 1s. 11d. to 2s. 1¾d.; fair to good clean brown at 1s. 10d. to 2s. 1¼d.; specky brown and dark at 1s. 8d. to 1s. 11¼d.; black and soft, part pressed, at 1s. 5d. to 1s. 10¼d. Scrap and Cuttings, fair to fine, at 1s. 4½d. to 1s. 7½d.; mixed and inferior at 8d. to 1s. 2½d.

Later news (November 18th) states that the market for Pará continues firm, but quiet. Hard Fine on the spot was quoted 3s. 4d. value, November delivery, 3s. 3½d.; November-December, 3s. 3¼d.; and December-January, 3s. 3d.

Plantation maintains a firm tone, and a fair business has been done. Standard quality No. 1 Crêpe on the spot sold at 2s. 5d. to 2s. 5¼d. and value; November delivery, 2s. 5¼d. value; December, 2s. 5¼d. buyers; January-March (1914), 2s. 5½d.

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

RATHER larger supplies were brought to auction during the first week in October, but importers holding for higher prices only part has been sold at steady prices. The stocks in the principal ports of Europe on November 1st, according to Messrs. Düüring and Zoon, show an increase for the month of 174,000 bags, against a decrease of 170,000 bags during the same period last year. The visible supplies show an increase for the month of 589,000 bags, against an increase of 531,000 bags at the same time last year. "Futures" have been easier, and we are closing at a decline of 1s. 9d. per cwt. on the week. We quote:—

				Oct. 30th, 1913
				To-day
London	...	Santos, Mar. del.	...	50s. 10½d. ... 52s. 7½d.
New York	...	No. 7 Rio	,	... 10.32 cents ... 10.88 cents
Hamburg	...	Santos	,	... 56 pf. ... 58½ pf.
Havre	...	Santos	,	... 68¾ francs ... 71¾ francs

The receipts at Rio and Santos from July 1st to November 5th, 1913, were 7,667,000 bags, against 6,531,000 bags and 7,664,000 bags in the two previous years respectively.

Sales include the following, viz.:—

Salvador.—Fair bold dull greyish, 80s.; peaberry, 78s.

Nicaragua.—Ordinary dingy foxy, 57s. 6d.

Vera Paz.—Fine ordinary, 69s. 6d.; middling, 79s. 6d. to 80s.; bold fair greyish to good dull coloury, 80s. to 84s.; peaberry, 68s. to 83s.

Colombian.—Bold fair to good, 80s. to 86s. 6d.; peaberry, 72s. to 85s. 6d.; bold soft musty dark, 73s. 6d.; ordinary, 65s. 6d. to 79s.

Java Robusta.—Good bold greenish, 54s.

Nyasaland (New Crop) sold up to 86s.

Demerara Liberian.—At 72s.

Guatemala.—Small fair coloury, 67s.; good middling to fine bold, 80s. 6d. to 86s. 6d.

Mexican.—Ordinary greenish and greyish, 59s. to 60s.

Unwashed Dumont.—Smalls, 52s. 6d. to 56s.; extra bold, 68s. 6d.

Uganda.—Fine, 72s. 6d. to 78s. 6d.; ordinary, 56s. to 64s. 6d.

Coco-nut Products, &c.

ACCORDING to Messrs. Mordaunt Bros., Cochin coco-nut oil was hardly mentioned at the latter part of October, and is still an idle market, whilst Ceylon oil has remained steady, being quoted at 45s. 6d. to 46s. c.i.f. per cwt. on October 25th, against 45s. 3d. to 45s. 6d. on November 8th, when buyers were offering a fraction lower. Palm kernel oil moved upwards during the same period from 43s. 9d. to 44s. 3d. f.o.b. Hamburg to 45s. f.o.b., or at least that was the quotation. Pressed oil was unchanged and steady at 44s. 3d. f.o.b. London for November-December, with buyers very near that price.

Prices generally on November 8th ran as follows:—

Palm oil (Liverpool):		1913	1912	1911
Per cwt.				
Lagos	...	33s. 6d. to 33s. 9d.	30s. 6d. to 30s. 9d.	32s.
Benin	...	30s. to 30s. 3d.	27s. 3d. to 27s. 6d.	30s.
Congo	...	27s. 3d. to 27s. 6d.	25s. 6d. to 25s. 9d.	28s.
Bleached	...	34s. to 35s. 6d.	32s. to 32s. 6d.	34s.
Clarified	...	30s. to 31s. 6d.	28s. 6d. to 30s.	30s. 6d.
Palm kernel oil		44s. 9d. to 45s.	36s. to 36s. 6d.	38s. 6d. to 40s. 6d.
Coco-nut oil:				
Cochin	...	60s.	47s.	49s. 6d. to 50s.
Ceylon	...	48s.	40s.	45s. to 46s.
English pressed	...	44s.	37s. to 37s. 6d.	38s. 6d.
Copra oil:				
Ceylon	...	None	39s.	45s.
Cochin	...	54s.	43s.	47s.

According to the *Public Ledger* of November 11th prices ruled as under:—

Soya Oil.—Hull: Naked extracted, spot, £26 2s. 6d.; November-April, £26. Oriental (in cases), October-November, £25 15s. c.i.f.; November-December, £25 15s. c.i.f.; December-January, £25 15s. c.i.f.; January-February, £25 17s. 6d. c.i.f.; February-March, £25 17s. 6d. c.i.f.; March-April, £25 17s. 6d. c.i.f. Antwerp.

Coco-nut Oil.—Ceylon spot, £48; October-November, £46 2s. 6d. c.i.f.; November-December, £46 2s. 6d. c.i.f. Cochin spot, £60; October-November, £49 10s. c.i.f.

Palm Oil.—Lagos on spot, £35 10s.

Palm Kernel Oil.—November-December, £45; January-March, £45 f.o.b. Hamburg.

Soya Oil Beans.—Parcels Harbin spot, £8 10s. Hull; December-January, £8 2s. 6d.; January-February, £8 2s. 6d.; February-March, £8 2s. 6d.

Linseed Cakes.—London made, £7 12s. 6d. to £7 15s.

Cotton Cakes.—London made, £5 10s. to £5 12s. 6d.

Copra steady, unchanged. Malabar, October-December, £32 5s. sellers, and January-March, £32 2s. 6d. Hamburg. Ceylon, September-October, £32 2s. 6d. sellers, and October-November, £32 2s. 6d. Hamburg. Java, July-September, £31 7s. 6d. sellers; August-October, £31 2s. 6d.; October-December, £31; January-March, £30 12s. 6d. Holland, Hamburg, and Bremen. Macassar, July-September, £31 2s. 6d. buyers; August-October, £30 17s. 6d., and October-December, £30 17s. 6d. Holland, Hamburg, and Bremen. Singapore, August-September, £31 2s. 6d. buyers; August-October, £31 2s. 6d., and November-December, £31 2s. 6d. Hamburg. Cebu, August-September, £31 10s. buyers, and August-October, £31 2s. 6d. Marseilles. South Sea Island, August-September, £30 12s. 6d. paid, and September-October,

£30 12s. 6d. buyers London. F.M. Straits, October-November, £30 12s. 6d. buyers Marseilles. October-November, £30 17s. 6d. sellers Odessa. Manila, August-October, £30 15s. buyers; October-November, £30 7s. 6d., and October-December, £30 Marseilles. Mixed no Padang, August, £30 15s. buyers, and August-September, £30 15s. Marseilles, all c.f. and i., delivered weight.

Regarding coco-nut oil, Messrs. Goodlake and Nutter report that the market is firm with an upward tendency, and there has been a fair amount of business during the week for c.i.f. New York. For Ceylon, November-December, December-January, and January-February we quote 46s. 9d. There is not so much inquiry for London except for near oil, but below sellers' ideas. We quote 45s. 7½d. to 45s. 9d. November-December, December-January. Cochin oil is not much in demand. We quote 50s. 3d. October-December shipment. Palm kernel oil is much firmer, and a fair amount of business was done at 46s. 6d. for near oil, but sellers are now asking 46s. 9d. to 47s., with buyers of January-March at 46s. 7½d., and sellers 46s. 9d. f.o.b. Hamburg. Pressed: There is nothing doing. Spot prices: Ceylon, £48 to £50. Cochin, £58 to £60.

The demand for linseed oil for soap-making, reported the *Glasgow Herald* a little time back, has been notably favoured because of the dearness of the regular soap oils, such as cotton and soya-bean oil, while the newly discovered process for hardening the latter (soya oil) is undoubtedly an important factor. Crop uncertainties will probably continue to affect the situation for some time to come, the market being very sensitive.

Rubber Share Market News.

DISCUSSING the Rubber Share Market on November 12th, Messrs. Zorn and Leigh-Hunt tell us that the price of Plantation rubber has further improved to 2s. 4d. per lb., and quotations in the share market continue to harden in sympathy. Quite a fair amount of investment buying is going on, and almost every change in the list is in an upward direction; meanwhile it is satisfactory to note that anticipations as to bringing down the cost of production are beginning to materialize. With the price of the commodity creeping up, and the cost of production coming down, it is not surprising that there are strong indications of public confidence returning to the Rubber Share Market, and that the pessimistic talk so prevalent a couple of months ago is no longer heard.

Elsewhere they tell us that one of the recent events in mining markets, so far as the general public interest is concerned, has been a smart recovery in Chartered shares, based upon the announcement that a land scheme is in course of preparation by Sir Starr Jameson and certain influential American interests, with the idea of bringing hundreds of acres into use for farming purposes. Rhodesia in its time has played many parts, most of them ending in a note of tragedy for shareholders in Rhodesian concerns. But there does seem to be scope for pastoralizing the country, as the Liebig Company, amongst others, is now doing, and, at the moment, attention is being focussed upon Rhodesian undertakings whose land may be expected to receive consideration from possible buyers.

The London Cocoa Market.

BY THE EDITOR.

Cocoa planters and those interested in exporting beans from producing to consuming centres, especially to the United States, will be interested in the October issue of the *New York Tea and Coffee Trade Journal*, as it contains a great deal of useful information on cocoa, raw and manufactured, also tea, &c., as shipped to America or elsewhere. Regarding cocoa, we are told, under the heading of "Four Hundred Years of Chocolate,"* how the drink was first introduced to the Old World by being introduced to the Courts of Europe and through that channel to the general public. The increase in its consumption during the last twenty years has been, as our readers well know, phenomenal. "In the year 1895," writes our contemporary, "the world-consumption of raw cocoa stood at 165,000,000 lb. In 1912 there were in the world about 1,000 cocoa and chocolate factories, working up yearly 440,000,000 lb. of raw cocoa. One circumstance, and not the least considerable, that led up to this increase, has been the gradual change in public opinion in regard to the value of these products." A second article, entitled "Cocoa Culture in Venezuela," gave collected and original information, illustrated with two blocks, descriptive of how cocoa is produced in that extremely fertile, but also extremely disturbed Republic. The bulk of the notes concern a visit paid by Mr. Isaac A. Manning to a plantation where the trees were producing well and yielded an extra high grade of cocoa. There were about 80,000 trees, which produced, we are told, 500 fanegas each 110 lb. cocoa, more or less. It is generally noted that where the quality of the bean is above the average the yield per tree runs lower. Of the ordinary cocoa of the grade known as Caracas beans, the average annual yield per tree will be 1 lb. The cost of harvesting, including administration, care of plantation, and marketing at port of embarkation in the Choroní and Ocumare districts is placed at 5.25 to 6 cts. per lb., whilst in the Rio Chico and other districts to the east of La Guaira it is placed at 2.8 to 2.5 cts., depending on distance from water transportation. Prices at that time stood at 9.83 cts. per lb. at La Guaira. It can therefore be seen that a fair margin of profit is secured by the producers.

Finally, article No. 3 discusses the "World's Trade in Cocoa," by John J. Macfarlane. This starts with the following paragraph, and then goes on to discuss individual producing and consuming centres. "Humboldt," Mr. Macfarlane tells us, "estimated that in 1806 the quantity of cocoa consumed in non-producing countries was 20,000,000 lb.; in 1906 it was 345,000,000 lb.; and in 1912, 551,000,000 lb.*"

Coming to the usual market chatter we will start with the Board of Trade figures of consumption in the United Kingdom for October. These show an increase of 600 tons in the Home Consumption of the raw material, and 320 tons in foreign manufactured. Here are the full figures:—

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Oct. 31st) Tons.
Jan.-Oct., 1911—	26,724	20,549	5,704	9,930
" " 1912—	26,427	22,154	5,232	8,478
" " 1913—	29,108	23,007	5,859	9,299
	Increases 2,681	853	627	821

During October only 2,504 tons were delivered for Home Consumption, against 1,895 tons last year and 2,454 tons in 1911. The figures of foreign manufactured are:—

	Landed. October only.	Del'd H.C.	Landed. January-October.	Del'd H.C.
1913 ...	1,286 ...	1,498 ...	10,544 ...	10,084 tons
1912 ...	1,272 ...	1,178 ...	8,326 ...	8,401 "
1911 ...	894 ...	760 ...	6,450 ...	5,878 "

In France the January-September figures show 19,543 tons (English) to have been delivered for Home Consumption, against 19,149 last year and 19,328 tons in 1911.

Coming now to the matter of production, it is interesting to note that the Guayaquil receipts which were "miles" behind as at end of April (169,500 qtls., against 357,500 qtls. last year) are now ahead, the figures for January-October working out at 655,000 qtls., against 653,800 last year and 686,300 qtls. in 1911. Trinidad complains of insufficient rain, whilst Mr. Hudson, in St. Lucia, says it is too wet and that their crop will not be right without hot-air dryers. I have no definite news of the Gold Coast exports, but hear that the August-September shipments are, as usual, very small; October begins to swell, November goes much larger, whilst December and January are the fat months. Last December saw some 10,000 tons exported; such a quantity should be considerably exceeded this year, provided the transportation facilities are there to get the cocoa out. Whether they are, remains to be seen. With San Thomé the landings during October were very much behind last year (10,322 bags against 70,167 bags in 1912), so that the total receipts for the ten months are now 100,000 bags behind, say, 353,511 bags, against 450,051 bags last year. Messrs. Martin, Weinstein and Co., of Lisbon, send us the following figures of the ten months' movement:—

Lisbon stock on September 30th...	...	...	Bags. 83,564
Add arrivals during October ...	...	...	10,322
		Makes	93,886
Deduct exports during October ...	...	...	57,605
Leaves stock on October 31st, 1913 of ...	...	...	36,281
Against " " 1912 ...	...	...	103,221

Bahias are behaving somewhat peculiarly, the figures are behind and the London market is bare of attractive supplies, and yet, instead of selling at 70s. or 69s. as fine Grenadas, buyers want to talk of 66s. to 67s., basing their values on reputed sales on these levels, and substantial sales too, about 7,000 bags in all. Why that centre should be so keen on knocking down the price is difficult to account for. Coming to the matter of stocks, Havre, it will be noticed, has pulled down hers by some 16,500 bags, whilst the London movements have reduced our 11,000 bags since my last report, which showed 86,050 bags on hand. Here are the figures:—

* See also the article on the first page *re* celebrating this Quadri-Centenary at the London Tropical Exhibition next year.

† This estimate is therefore 25% more than the one given at the beginning of these notes, the balance not going through factories.

<i>London Stock, November 8th</i>	1913. Bags.		1912. Bags.		1911. Bags.
Trinidads ...	11,752	...	7,005	...	6,713
Grenadas ...	2,813	...	713	...	6,811
Other W.I. ...	3,630	...	6,866	...	5,498
British Africa ...	5,354	...	4,754	...	2,757
Portuguese Africa ...	6,208	...	6,094	...	2,300
German Africa ...	3,078	...	9,749	...	6,044
Ceylon and Java ...	12,141	...	10,687	...	12,465
Guayaquil ...	18,644	...	36,374	...	43,068
Brazil and Bahia ...	2,437	...	3,468	...	340
Other Foreign ...	9,124	...	7,083	...	8,394

Totals ... 75,181 ... 92,793 ... 94,390

<i>Havre Stock, October 31st—</i>	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
Pará ...	9,143	84 to 87	15,042	83 to 85
Bahia ...	3,824	77 „ 84	2,594	75 „ 80
Venezuela ...	53,982	90 „ 200	29,981	82 „ 205
Trinidad ...	20,455	83 „ 87	25,947	83 „ 92
Grenada and O.W.I. ...	1,464	81 „ 85	2,563	74 „ 83
San Thomé ...	2,225	82 „ 85	3,626	74 „ 76
San Domingo ...	5,725	76 „ 79	10,122	69 „ 74
Haiti ...	2,636	70 „ 82	8,752	62 „ 75
Accra ...	33,614	78 „ 80	30,828	69 „ 74
Guayaquil... ..	15,492	80 „ 86	14,811	75 „ 80
Others ...	12,875	—	4,150	—

Totals ... 161,435 bags 148,416 bags

In Hamburg, according to the *Indian Trade Journal*, a company is making a product out of soya beans as a substitute for coffee, or to be mixed with cacao. For this purpose, we are told, the beans are parched and ground; but we are not told the address of the concern, nor how the public has taken to such a “fake.”

Based on business done up to time of going to press (November 18th) prices and values go as follows:—

Trinidads have been selling spasmodically at 76s. for fine red, and 73s. for good middling to 75s. good red marks.

Grenadas.—Fine has been selling up to 69s., whilst ordinary unfermented sold at 64s., and good fair, at 66s. 6d.

St. Lucias.—Good to fine are worth 66s. to 69s., and common unfermented sold down to 62s. 6d., while Hudson's Improved Pentagona realized 83s.

Dominicas are worth from 62s. to 68s., but I have not seen any reports of sales lately.

Jamaica.—The finest markets are worth 69s., and fine red sold at 67s., whilst low unfermented sold at 60s., and common to fair are worth 62s. to 65s.

Costa Rica sold at, or are worth, 68s. for good boldish and 63s. for fair.

Java.—Good bold sold up to 76s. 6d.

Samoa.—Medium boldish realized 75s.

Cameroons.—Fine red sold at 66s.

Bahias are worth—what? Some say 69s. for superior and 64s. for fair, whilst others talk of 2s. to 3s. less. Sales alone will show who is right.

San Thomé are worth perhaps 65s. to 66s., but I have not heard of any sales.

British West African sold at 61s. to 62s. 6d. for good fermented.

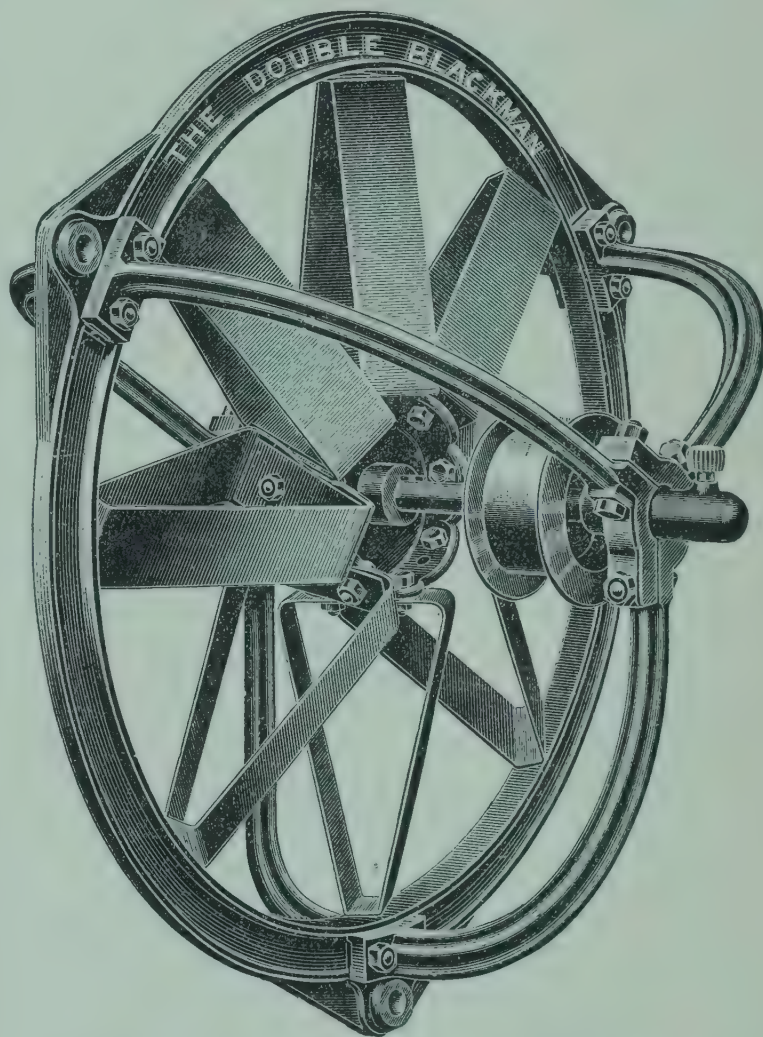
Guayaquils have been selling at 70s. to 73s. for Arriba, Machala 66s., and Caraquez 67s. 6d. to 70s. The best Caraquez is valued at 71s., Machala 68s., and Arriba perhaps 74s.

Ceylons have been quite busy and sold freely, mainly good to fine bold at 81s. to 86s., whilst fair to good medium is worth 70s. to 80s.

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Tropical Life:

A Monthly Journal devoted to the Interests of those living, trading, holding property, or otherwise interested in Tropical and Sub-Tropical Countries.

VOL. IX.—No. 12.]

DECEMBER, 1913.

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Greetings.

THE Directors and Editor of TROPICAL LIFE present their compliments to the readers and advertisers in the Journal, and wish one and all a Merry Christmas and a prosperous and progressive New Year. As can be seen by this number, we have more than held our own, and our best thanks are due to those whose assistance and support have enabled us to do so. It has been one of three strenuous but successful years, during which we have published four standard works on tropical enterprises and contributed papers to the leading Congresses on Tropical Agriculture. Doing all this has been a great pleasure to ourselves, with equal benefit to our friends; and we trust to do as much, if not more, in the future than we have done in the past.

The Liberal Colonial Club and the Over-seas Dominions.

THE above Club, through whose assistance we were able to discuss the idea of establishing Agricultural Colleges in the Tropics at Lord Glenconner's "At Home" with Sir Edward Grey, and later on to arrange for the highly successful drawing-room discussion on the same subject at Sir Robert Perks's, was formed for the study and discussion of Imperial questions and for promoting intercourse between Liberals at home and visitors from the Dominions, India, the Colonies, &c. Being anxious to increase its opportunities for forwarding these purposes by the enrolment of honorary correspondents over-seas, the Secretary would be glad to hear from those willing to become correspondents, whether in the self-governing Dominions, in India, or in any British Colony or Protectorate, who could give valuable assistance to the Club by sending news of important questions in their several localities, and by letting the Club know of any representative men in those localities who are proposing to visit London. Anyone desirous of becoming honorary correspondents or of obtaining further information about the Club is requested to communicate with the Secretary, Sir Alexander Lawrence, Bart., 3, King's Bench Walk, Temple, London, E.C.

"The Fermentation of Cacao."*

FURTHER NOTICES.

"I HAVE ordered a copy of your new book," wrote Mr. W. H. Johnson, F.L.S., Director of Agriculture for Southern Nigeria, "as I always do in the case of

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* TROPICAL LIFE Publishing Department; 10s. net, 11s. post free.

your publications. This book on 'The Fermentation of Cacao' should prove of great assistance to cacao growers, but will probably do most good in stimulating interest in a, at present, much too neglected subject."

"Among the galaxy of experts before us, it goes without saying," says the *Indian Planters' Gazette*, "that the subject has been handled in all its details."

The book also contains some notes on the fermentation, oxidation, and drying of coffee, tea, &c., for shipment; there are 35 good illustrations, among which may be seen the cacao trees in full bearing, sections of the fruit, &c."

"The book shows," writes the *Tropical Agriculturist*, of Ceylon, "that every endeavour has been made to bring together the most reliable information so far published."

Der Tropenpflanzer, of Berlin, prophesies that, with the passing depression in the rubber market, a depression that is particularly felt on the West Coast of Africa, our book on "The Fermentation of Cacao," will stimulate attention to the production and preparation of that article.

Many reviews have yet to come, including those to which we are looking forward with considerable interest, as they will bear rather on the scientific side; we refer to reviews we hope to see appear in such papers as *Nature*, *Imperial Institute Bulletin*, *Journal of the Chemical Society*, and others.

"Coco-nuts—the Consols of the East."

THE SECOND EDITION.

THIS book, now complete, is being indexed. In spite of our efforts to get the book out by the end of November we have not succeeded in doing so. Copies will be ready early in the New Year. The new edition totals 614 pages, exclusive of the index, foreword and introduction, which will cover another 100 pages, and will cost, as already stated, 12s. 6d. net, or 13s. 6d. post free.

IN connection with the International Cotton, Fibres and other Tropical Products Exhibition to be held in conjunction with the Rubber Exhibition at the Royal Agricultural Hall in June, 1914, the British Cotton-growing Association, who are making an important display at the Exhibition, have issued a circular giving particulars of four prizes they are offering, as follows: First, a Silver Trophy for the best general exhibit of various varieties of cotton shown by any Government Department of Agriculture of any British Colony or Protectorate or of Egypt or the Anglo-Egyptian Sudan, such exhibit to have been grown during 1913 or 1914 on any farm or farms under Government supervision; secondly, Three Silver Cups, viz., one each for the West Indies, Nyasaland and the Anglo-Egyptian Sudan for the best type of cotton grown on any farm or plantation during the years 1913 or 1914. Further particulars may be obtained from the British Cotton-growing Association, Manchester, or from A. Staines Manders, Organizer of the Exhibition, 75, Chancery Lane, London, W.C.

Agricultural Colleges for the Tropics.

WE are glad to see that the Royal Colonial Institute thinks well of our idea of the West Indies having an Agricultural College. We hope now Mr. James Boosé has returned from South Africa that arrangements will be made for a leading authority on West Indian affairs, say Sir Norman Lamont or Sir Owen Philipps, K.C.M.G., to read a paper on the subject at an early date before the Fellows of the Institute. This is what the Editor of *United Empire*, the organ of the Institute, says:—

"*Proposed Tropical Agricultural College.*—The West Indies have long been feeling the want of an institution for higher agricultural education, and the question as to where such a college should be established has been receiving much attention of late. Trinidad has been suggested as the place best suited to fulfil all the essential requirements. The climate is deemed sufficiently tropical for the successful propagation of the tropical plants, while it is not so hot as to be in any way unhealthy. Land would be available for experimental purposes, with plantations in which the different economic plants could be studied while growing in a natural and uncultivated state. Communication with the rest of the world would be easy, and the stability of the Government would ensure the peaceful pursuit of the work in hand. If possible, the college would be connected directly with some British University, but failing this an endowment would have to be obtained from private sources."

"After consulting Professor Dunstan, Director of the Imperial Institute," the *Manchester Guardian* told us some little time back, "Mr. Harcourt sanctioned the proposals for the creation of an Agricultural Department in Ceylon. The Director's (Professor Dunstan's) report concluded with a plea for the establishment of a College of Agriculture in Ceylon, but Mr. Harcourt's dispatch sanctioning the creation of the Agricultural Department was silent, we understand, as regards the establishment of the College."

The West Indies may still start first, through the nucleus of the College being established in conjunction with the existing Department of Agriculture. We say this because that Department will probably have a building available next year at St. Augustine's, one of the Government stations, which should be large enough to accommodate the staff, and a spare room for two or three specialists. With such a building already *in situ* in the centre of the Experiment Station and of the work that those attending such a college would wish to be associated with, we feel certain that a modest beginning can be made, and once that is started, if the necessary funds do not appear from somewhere (as they would do, we feel sure, if it was a church or chapel), we shall be both surprised and disappointed. We trust that we shall be neither.

THE shot-hole borer seems to be giving trouble in Ceylon, one, too, that tends to increase. On account of this, the island press tells us the Committee on Agricultural Experiments are urging upon the Government to appoint an entomologist specially to study the life-history of the pest with a view to discovering a method of control.

Tropical Plant Diseases.

THEIR PREVENTION AND CURE. PART I.

ON the following page we call attention to Professor Thurston Cook's recently published work on "The Diseases of Tropical Plants," and shall have reason to refer to it again on many occasions in the course of the series of articles, of which this is the first, that we intend publishing on the subject. We hope, therefore, that our readers will secure copies of the work in order to read up and investigate the various points we raise in a way we cannot do in this Journal. Certainly it is time to be up and doing and to map out the Tropics on an international basis as regards plant diseases in the same way as has been done to a considerable degree in regard to diseases of man in the torrid zone. Dr. Prout, of the Liverpool School of Tropical Medicine, and others have truthfully described Sir Patrick Manson as being the real builder of the Panama Canal, meaning that had it not been for his investigations and discoveries the Panama Canal could not have been completed, and had it not been for Sir Patrick, Sir Ronald Ross, and others, whom exigencies of space alone prevent us from naming, we could not be drawing, as we now do, the large consignments of tropical produce, raw material, food, &c., from those formerly unhealthy localities which supply them so prodigally to us to-day. This prodigality, however, has its limits: exhaustion of plant-foods in the soil, decreased dampness and rankness in the surroundings as the districts become more opened up, drained, and aerated—in a word, the very making of the surroundings more "civilized" and healthy—all tell against a continuance of the supplies by natural causes alone. Man is civilizing and crowding the wilds of the Tropics with vegetable life as he has done elsewhere with human beings; but in doing so he has not only reduced the allowance of pure air, fresh water, and elbow room generally available for each, but, thanks to his care and attention, has enabled the

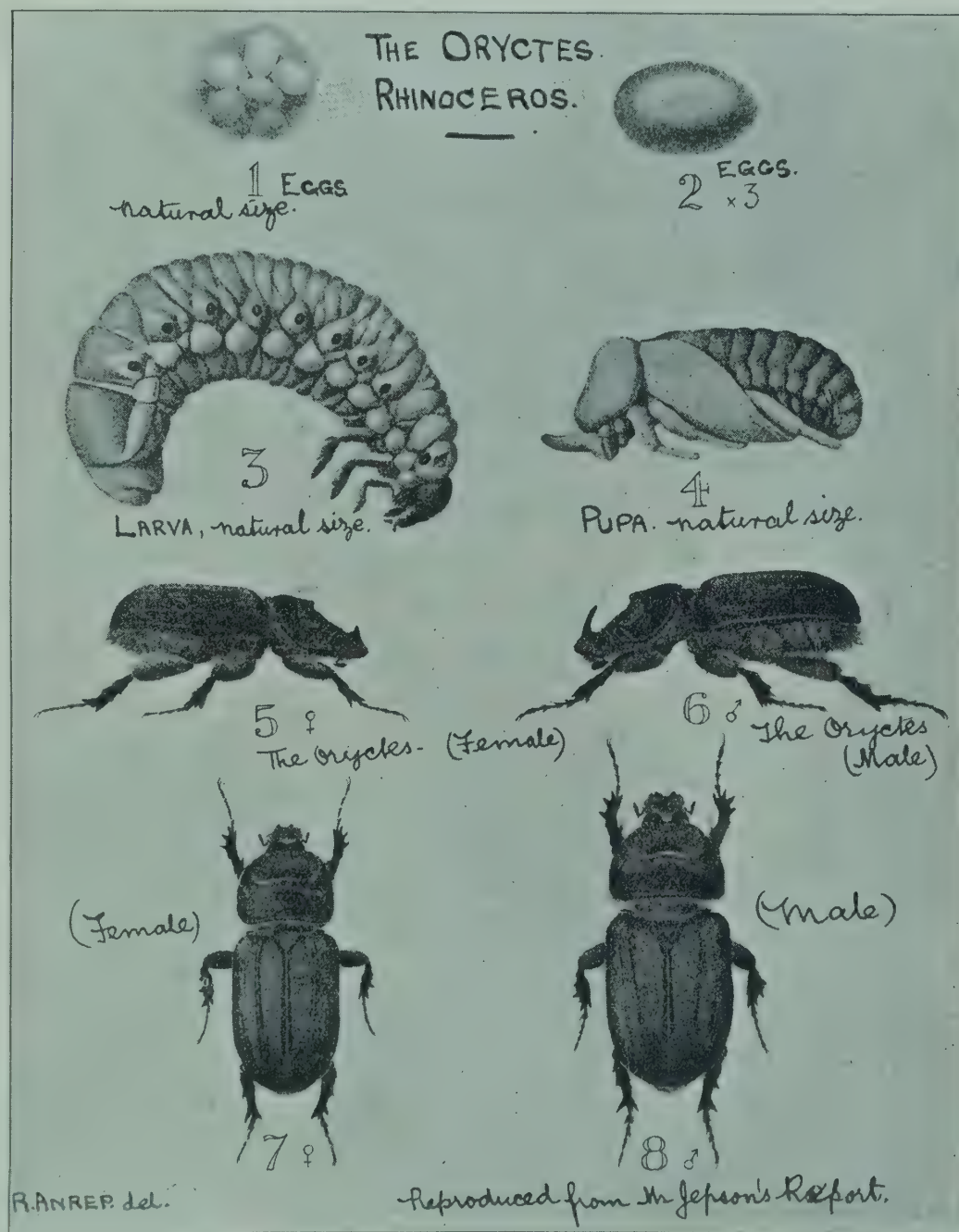
more weakly ones to survive, whilst the artificial surroundings tend to reduce the vitality of the stronger plants, with the inevitable sequence that plants, like people, in these more or less artificial surroundings are neither as robust nor as healthy as their forebears.*

"Both plants and animals are subject to diseases which reduce their vitality, check development, or cause abnormal growths, and frequently result in the death of the affected individuals," Professor Cook tells us in the opening words of his introduction. "When these diseases attack the cultivated plants on which mankind depends for food, clothing, building materials, fuel, &c., they always cause loss. Such losses may be comparatively insignificant, or they may be sufficiently

great to cause financial disturbances and suffering in the community or nation. In many cases these losses have been so great as to cause local famine, and sometimes they have been so great as to increase the cost of the agricultural products throughout the world. As a result of certain well-known diseases, the export trade in many agricultural products has been greatly reduced or completely destroyed in parts of the world. . . .† It is well known that many plant diseases, although recognized by the grower, receive very little attention from him until they become destructive to his crops. The fact that the disease, which is of little importance to-day, may become very destructive in the near future, does not excite most

growers to use the precautionary measures necessary to prevent the spread of these diseases."

The most indifferent planter, whether he leaves the



* "Trees, like human beings, become, under civilized conditions, more delicate and liable to disease, or else it is that the scientific man and the doctors enable them to live under conditions which, in the natural state, the struggle for existence would have rendered impossible. In any case, their average vitality is below that of the less cultivated kinds." See "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates," TROPICAL LIFE Publishing Department. Price 11s. post free.

† As with the *Hemileia* disease and Coffee in Ceylon, and very nearly with Witch-broom disease and Cacao in Surinam.

trees and his own interests to their fate or not, knows that every word Professor Cook has written as above is true. Realizing that the time has come to start a systematic campaign against plant diseases and pests, in order to increase and assure the supplies that our factories and larders need from the Tropics, we have arranged to publish a series of articles on "Pests: Their Prevention and Cure," which the leading authorities will assist us to make as complete as possible. We hope, therefore, that those interested in the matter, whether producers or makers of spraying machines and fluids, will support us throughout the campaign both with their knowledge and experience, as well as by their subscriptions and financial support. Among the firms who have already promised to contribute articles are Messrs. Weeks and Sons, Ltd., Maidstone; The Deming Company, of America; Messrs. Robinson Bros., Ltd., of Ryder's Green; the four leading Birmingham firms that go to make up the United Brassfounders, Ltd.; Messrs. Ph. Mayfarth and Co., of Germany; Vermorel, of France; Florozon, Ltd., of London; Walter Voss and Co., Ltd., of London; The Four Oaks Spray Machine Co., Ltd., of Birmingham; and many others. Between so many authorities we believe that, with the help of the plant doctors in the Tropics and the co-operation of the planters, great progress will be made during the next year or so in restricting the ravages of disease and pests in the Tropics, and increasing the output of the estates.

Reviews.

THE DISEASES OF TROPICAL PLANTS. By Melville Thurston Cook, Ph.D. 309 pp., 85 illustrations. Price 8s. 6d. net. Macmillan and Co., Ltd., St. Martin's Street, London, W.C.

THIS is a book the appearance of which we greet with the greatest pleasure. We are told you can have too much even of a good thing. Plant-diseases are not a good thing, but a very bad one, so we may be excused for saying that no one can have too much information about them, and although the amount that has been crowded in this book is marvellous, yet we only regret that there is not still more, especially regarding remedial or preventive measures. Dr. Cook is Professor of Plant Pathology at Rutgers College, New Brunswick, U.S.A., before which he was chief of the department of Plant Pathology in Cuba. On p. 99 a discussion on the "Diseases of Rice" is started from the pen of Dr. Haven Metcalf, of the U.S. Bureau of Plant Industry. Among economic plants and their diseases discussed are sugarcane, maize, pigeon peas, rice, cotton, citrus and other fruit, tobacco, coffee, tea, cacao, rubber, coconuts, palms, vanilla, spices, vegetables, &c. Chapter VIII deals with forest and ornamental trees, then we come to prevention and control, fungicides and spraying apparatus, the whole concluding with a long list of the leading authorities and the articles or notes that they have published on the subject. From this list we notice that the name of TROPICAL LIFE is absent, also those of our book on "Coco-nuts" and "Notes on Soil and Plant Sanitation on Cacao and Rubber Estates," as well as Mr. Johnston's book on

"The History and Cause of Coco-nut Bud-rot," but as there are some 350 references in the list, anyone wishing to secure the key of an exhaustive study on the diseases and pest which attack economic plants in the Tropics will find it most useful; it will certainly supply them with work to last them a very long time.

THE SNAKES OF EUROPE. G. A. Boulenger, LL.D., D.Sc., F.R.S., &c. 264 pp., with 14 plates and 42 figures of snakes, their bones, &c. Price 6s. Methuen and Co., Ltd., 36, Essex Street, London, W.C.

The above work (which is uniform with such books as "The Life of Crustacea," "British Freshwater Fishes," "The Ox and its Kindred," "The Life of the Mollusca," issued by Messrs. Methuen) contains descriptions of all the European species of snakes, the characters of which are illustrated by numerous text figures and plates, with an account of their habits and distribution. In the introduction the author deals with the morphology, ethnology, classification and distribution of snakes generally, together with a chapter on "Snakes in Relation to Man." Those interested in these pests, whether in Europe or elsewhere, will find the book of great use. It has, from all appearances, been most carefully written.

PLANTING IN UGANDA. By E. Brown, F.L.S., and H. H. Hunter, LL.D., with introduction by Professor Wyndham Dunstan, C.M.G., and a chapter on "Fungoid Diseases" by Mr. George Masee, of Kew. 175 pp., 41 illustrations, with two maps. Price 10s. 6d. net. London: Longmans, Green and Co. Dublin: The Talbot Press.

Readers of this book will find it interesting and useful, and all will welcome it, for those responsible for its being are men of experience. Mr. Brown was formerly a member of the Botanical and Scientific Department, Uganda, under Mr. M. T. Dawe, F.L.S.,* and is now Manager of Kiouvu (Uganda) Rubber Company, whilst Dr. Hunter is a director of this and two other Uganda planting companies. The book is practically a carefully-thought-out and compiled handbook on planting coffee, cacao, and rubber in Uganda, so that many planters elsewhere may be glad to know of it, especially those who, like ourselves, are on the look-out for a handy and reliable handbook on coffee-planting. Clearing land, nurseries, planting out, weeds, weeding and upkeep, machinery, preparation of the crops, general management, costs, pests, and diseases, each are taken in turn, chapter by chapter, and, with the numerous illustrations, are pleasant to read and easy to understand.

One or two little slips are noticeable. 1309 will be found on p. 13 instead of 1909. Page 73 refers us to fig. 24, but the plates are not numbered except in the Index; and on p. 75 *Manihot Glaziovii* is spelt with only one "i" (*Glaziovi*). Engineers will not agree with the seven lines devoted to rubber and drying machinery, which conclude by saying that "it will be several years before we need to think of such processes," and we hope in their next work (which

* See "Our Friend," October, 1909.

we shall look forward to with pleasure) the authors will devote more attention to leguminous crops and green manuring, which are only mentioned now. But these latter are not faults, noticing them shows how interested we have been in the book. The details given, with descriptive illustration of the coffee leaf disease (*Hemileia vastatrix*), alone would make one take careful note of the book. With apologies to the authors, or rather, to Mr. Masee, of Kew, who supplied this section, we will quote the following paragraph from p. 159: "Unfortunately, up to the present no means of keeping this parasite in check have been discovered. Spraying with Bordeaux mixture, where practicable, would be effective, but the spraying should be commenced *before* the appearance of the fungus on the leaves. In those districts where the fungus has been previously observed, the planters will know the proper time from experience. The danger arising from the presence of fallen diseased leaves must be kept in mind. It has been demonstrated that coffee trees grown in the open are less susceptible to the disease than those grown in the shade."

When we have got our second edition of the "Coconut" book off our hands and have more time, also more room in the Journal, we will return to this book. Meanwhile, cacao and coffee planters who have been using bamboo joints for their seedlings may be glad to study the illustration facing p. 50, showing how the natives on Kiouvu estate make excellent pots out of banana leaf stalks.

Rubber Planting with Dynamite.

A DEMONSTRATION AT KUALA LUMPUR, FEDERATED MALAY STATES.

SINCE we contributed our paper to the New York Congress on "Farming with Dynamite," we have been pleased to notice what steady progress has been made in familiarizing the planting world with the use of explosives for land cultivation. The latest news on the subject recently came to hand in the shape of the following notes, for which we are indebted to the *Malay Mail*, who tells us that of late much discussion has centred round the topic of the use of explosives in agricultural operations, and a demonstration carried out on the Government Experimental Plantations by Mr. MacQueen, representing Nobel's Explosives Company, Ltd., of Glasgow, will doubtless tend to quicken interest in the question.

The most recent application of explosives to agriculture has been in the breaking up of "hard pan" and other impervious subsoils. Recent experiments in America have demonstrated that "hard pan" can be blasted with advantage, and, in various parts of the world, many acres of land that hitherto were practically worthless are now bearing phenomenal crops. It has, moreover, been found possible to reclaim swampy land and to drain swamps by blasting the impervious clay beneath them; and fruit growers in many instances use explosives in preparing the ground for the planting of fruit trees.

It is in breaking up "hard pan" that the use of explosives is expected to be of most service in the

F.M.S., and the following experiments were a very successful demonstration of the effectiveness of Nobel's (of Glasgow) gelignite for the purpose, even though the site chosen was not the most suitable, being a very soft soil not particularly in need of the treatment. But in the F.M.S., as in other parts of the world, at a slight distance below the ordinary open subsoil, a hard layer of clay or other practically impervious subsoil is found, which acts as a trap for surface water, impedes the growth of tree-roots, and prevents them getting the necessary sustenance.

Later, in a plantation of two-and-a-half-year-old rubber trees, Mr. MacQueen placed rows of gelignite* cartridges at a depth of about 2½ ft. below the surface, and fired them by means of fuses and detonators. On the surface there was little visible effect of the explosion, but when the soil was turned over, it was found to be split and broken in all directions. The effect of each explosion is stated to be felt over a circle with a radius of 12 ft., and is claimed to have beneficial results over a period of two and a half to three years. And all this at a depth which the coolie with his changkol could not hope to touch. The inclusive cost of boring, explosive fuse, and detonator for each hole is at the outside 13 cents, and the benefit to any plantation of a thorough and comprehensive treatment by explosives is too apparent to need explanation.

Another use demonstrated during the trials was the blasting of holes for planting trees. Half a cartridge was exploded at a depth of 20 in., and when the top soil was scraped off a cavity a foot in diameter was revealed. Of course, what has been said above as to the benefit to the soil in preparing it for the easier growth of the roots applies also in this case, while the whole process is much quicker and handier than digging by hand.

Yet another use is for felling. A large old jungle tree was selected for the purpose, and eight cartridges placed in the centre of the trunk at a height of about 5 ft. from the ground brought the tree down in a very small portion of the time which would have been occupied in felling it by ordinary methods.

On the question of time occupied in breaking up "hard pan" by explosive, or "ploughing by dynamite," as it has been picturesquely termed, Mr. MacQueen stated that with two coolies he bored holes for, and placed in position thirty cartridges, ready for exploding, within an hour. The harder the soil, of course, the more effect has the explosion, this method having been used with most success in the case of laterite soils.

For removing stumps gelignite also has its uses, though to be effective the bore-holes must be made very carefully, for in the F.M.S. most of the trees are of the "buttress" type, and it is at times very difficult to judge whether you are boring straight into wood, or out again into the soil. However, a large stump was very effectively shattered this morning, showing that a very little work would have removed the whole lot. So far as Malaya is concerned, therefore, we feel that if the use of explosives in agriculture is new, it will soon become popular.

* The City office of TROPICAL LIFE has on show a case of dummy facsimiles of all these cartridges, together with fuses, wires, detonators, &c., the whole forming a complete outfit.

TEA NOTES.

ACCORDING to the report of the Director-General of Agriculture for the Belgian Congo, tea-planting experiments at the Experimental Station at Lala lead the authorities to believe that the shrub, *Thea viridis*, var. *Assamica*, could be cultivated in the central portion of the Belgian Congo, once experts were introduced to teach the local men the latest methods of preparation. Tea produced locally, on being exported to Belgium, realized Fcs. 2.50 per kilo, or about 1s. per lb., and was classified as "Good Assam."

The export of tea from Japan during the nine months, January to September, show a decrease compared to last year. This is attributable, according to the *Yokohama Chamber of Commerce Journal*, to the fact that a large amount of tea was exported to America in anticipation of a decrease in the import of Chinese tea, as a result of the enforcement of the prohibition of coloured tea and the aggregation of stocks imported from other countries. At the same time, the taste for Ceylon tea has increased.

Referring to our remark last month in this column "that the high level of value is tending to affect consumption," our friends, Messrs. McMeekin and Co., evidently do not agree with this, for in their circular of December 2nd they told us that, as regards our home consumption, the demand has been maintained in a remarkable manner, and so far there is no indication that the increased first cost is causing restricted use, deliveries in the United Kingdom from June 1st to November 30th being 179,877,000 lb., against 172,461,000 lb. last year, and 167,965,000 lb. in 1911. The explanation is that there is no change in the prices asked from the consumers. All that has happened is that the quality is doubtless, in many cases, somewhat inferior and distributing profits reduced. The increase in home consumption during the eight months expired of the financial year has fairly well justified the estimates of the Chancellor of the Exchequer when introducing his last Budget, which at the time were considered by most tea trade authorities to be too sanguine. The explanation may be found in the fact that, owing to the operation of the Old Age Pensions and the National Health Insurance Act, there is now always a certainty of money circulating amongst those who formerly were liable to be short of it, and as tea is, water excepted, the cheapest and most convenient of liquid beverages, the sale of it has, amongst the poorest of the population, been increased; there are indications, however, that the increase in cost is telling upon the foreign demand and exports.

We would like to make one or two comments on the above. Firstly, in the City of London the tank or cistern water one is compelled to drink, although no doubt perfectly healthy and safe from the scientist's point of view, is so disagreeable and unsavoury to the palate that no one drinks it who can avoid doing so. Either a "wee drappie" goes in it or preferably into soda or other mineral water, or else, what is undoubtedly done to-day to a far greater extent than formerly, especially since the female element has invaded and overflowed into our offices and factories, large quantities of tea are brewed and consumed in the aggregate by female and male alike. This, plus

the increased consumption due, as Messrs. McMeekin point out, to satisfy the Old Age pensioners' requirements, must have caused a considerable increase in the demand for the cheaper grades of tea. If the price to the consumer is maintained at the cost of the quality, the same result of a rise in price will soon follow, for the consumers complain to the housewife, and she to the retail distributor, perhaps even changing her regular one, until, finding out that one is no better or worse than the other, a higher price is reluctantly paid in order to get the previous quality. This, although it causes the grumblings to cease, generally brings about a curtailment in the quantity consumed wherever possible, and so soon makes itself felt in the deliveries.

Messrs. Wm. Jas. and Hy. Thompson, writing on December 4th, reported that while the market for Northern Indian tea continues to sag, that for other growths remain good, though some irregularity has been apparent. The feature has been the sustained demand for all tea up to about 8d. per lb., the supply of which is below normal, and in the case of Indians these are the only grades that have shown little or no decline in value; above this, the tone has been quieter, and the market closes exceptionally irregular, with lower quotations for indifferent liquoring stalky mediums and good Broken Pekoes.

The manufacturing season in Northern India is now practically closed, and latest advices indicate an increase of about 5,000,000 to 6,000,000 lb. in this year's crop, which will probably be equally distributed between the United Kingdom and foreign markets; against this, however, a considerable deficiency in supplies is assured from both Ceylon and China, while Java will fall short of its estimated increase. The quantities brought to auction of Ceylon and Java tea are commensurate with the relative positions of the crops compared with last year, but importers of Indian tea have sold less, and the above estimated share of the increase in the crop, and about 6,000,000 lb. more, have yet to be marketed. In the meantime deliveries are fairly good, but exports are disappointing.

Meanwhile, the market for Indian teas continues to show a downward tendency for all but common qualities, and this movement was particularly noticeable in the case of ordinary medium grades between 8d. and 9d. per lb. Sellers were not disposed to meet the market on Monday and withdrawals were considerable, especially of indifferent liquoring whole-leaf grades at 8½d. and 8¼d. per lb. Common tea was about steady on last week's level at the close, but good Broken Pekoes at 1s. per lb. and upwards were lower. On Wednesday the market was unusually irregular, and although there was a good demand at about Monday's level of value for tea up to 8¼d., there was a quieter tone towards all other grades, especially for stalky leaf and thin liquoring sorts. For the better grades of Broken Pekoe from 10d. upwards the market was again weak, and these must be quoted fully ½d. to 1d. lower. The average for the whole sale on Garden account is 9d. per lb., against 8½d. per lb. a year ago. The average for Ceylons for the whole sale on Garden account is 9¼d. per lb., against 9½d. per lb. last year.

The Cultivation of Cacao. No. XXX.

PARTLY on account of its cacao-planting industry being such an old-established one, and partly, perhaps mainly, owing to the personality of those owning the estates when the industry passed from the "squatter" and "peasant proprietor" stage to that of important estate owners, our West Indian island of Trinidad has always been to the front when questions of the production and preparation of cacao are under discussion.

Starting from 1797, when the English took the island over from the Spaniards, one of the most prominent names that have been left behind is that of the Almandoz family. Then there was José Puyados, the Catalan who for years was the supreme and practically the only buyer in the Port of Spain when "old Ambard" was a big shipper, and "old Charles Fabian" bought freely for the house of Fry. Puyados was the cause, directly or indirectly, of Leon Centeno settling in Trinidad and becoming an extensive planter, just when the Maingots, Farfans, Llanos, and others were at their height. Then there were "old Rostant," the De Gannes, Borde, Leotaud, Henri Court (the judge), Louis Preau at Couva, the Scheults, and, best known of all, F. S. Strickland, with his mark "La Torreceilla," prepared by the "Strickland method of sweating and fermenting," which up to now is mentioned in all handbooks on the subject. Mr. Kruger was then in charge of the Botanical Department, being succeeded first by Mr. Henry Priestly, and later, in 1875, by Mr. Hinchley Hart, and this brings us down to present times. Out of these, Strickland's method of "sweating," Borde's writings, Hinchley Hart's book on "Cacao," now in its third edition, and Olivieri's useful work on the same subject naturally cause all careful planters and students of this industry to have the above books and those of other Trinidad authorities, whose names have escaped us for the moment, on their bookshelves or close at hand for reference.

Now Grenada, jealous of the fame secured by the long years of experience of her sister, has made a bid to take the place she deserves by the side of Trinidad. As far back, we believe, as 1714 Grenada first started cultivating cacao, and in 1781 exported 2,716 cwt. or so. In 1855 this had increased to 5,069 bags, or over 1,000,000 lb., which became 5,864,090 lb. in 1881, and in 1892 her exports had increased to 44,833 bags, which became 73,863 in the 1909/10 crop (their record output), and 63,050 bags for the October-September crop 1912/13, which has just closed. It is our old friend Mr. W. M. Malins-Smith who is striving to make Grenada occupy that niche which he and many others consider she deserves, by means of the series of articles he has written, and the *West India Committee Circular* are publishing, on "Practical Cacao Planting in Grenada." Mr. Malins-Smith is in charge of one of the best-known estates in Grenada, and is always to the front at the meetings when questions of estate management and agriculture generally are being discussed in the island, and we certainly know of no one who is better qualified to write such a series of articles than he.

At the time of writing, the issue of the *West India Committee Circular* for November 18th (No. 395) has

just come to hand, containing the XIXth article from Mr. Malins-Smith's pen. As the *Circular* appears every fortnight, our readers can easily work out when the first article made its appearance. Looking through the last eight numbers (Nos. 388 to 395), and starting with No. 388, those interested in our "Fermentation of Cacao"* will note that a convenient size for the sweating boxes for an estate which gives a crop of about 1,000 bags is 5 ft. square and 4 ft. deep, making 100 cubic feet in all. This will hold sufficient wet cacao to give twelve bags of 180 lb. each of cured cacao. The most convenient style of sweating box is that which has sliding partitions and fronts. . . . In a series of sweating boxes fitted with sliding partitions and fronts one man can shift 500 baskets of cacao, equal to sixty bags when cured, in four hours, say from 8 a.m. to noon. Twelve baskets of cacao pods give two baskets of wet cacao; four baskets of wet cacao, *i.e.*, without the pods = 1 barrel, which weighs 300 lb. or more.† Thirty to forty seeds go to the pod, twelve pods = 2½ lb. of wet cacao, which, when cured, should give 1 lb. dried beans. If, therefore, as Mr. Malins-Smith maintains, a cacao tree in a first-class bearing field in Grenada gives forty to fifty pods, the annual output should be 3½ to 4 lb. dried cacao per tree. This issue (388) concludes with details of the changes which the beans undergo during fermentation, and the pros and cons of artificial *v.* sun-drying. The next number (August 26th, No. 389) has an interesting discussion on whether flowers are produced only from the "cushions." Mr. Malins-Smith dispels the illusion. "It is true," he tells us, "that an old tree produces more flowers on its cushions than elsewhere on its stem; but if this theory is correct, one will naturally inquire where did the flowers come from that produced the pods that made the cushions? It reminds one of the old riddle, 'Which came first, the hen or the egg?'"

Then we come to the matter of the "wicked waste of infantile life" in the cacao-producing world. It is estimated, we are told (p. 393), that about 99 per cent. of the flowers produced on a cacao tree fail to set fruit which arrives at maturity. Of the 5,000 or 6,000 flowers produced by an average cacao tree, only, at the most, 500 flowers seem to become fertilized and produce pods, of which (500) perhaps fifty or sixty only reach maturity. The cause of this has not yet been thoroughly investigated. *Circulars* No. 390, 391, and 392 deal entirely with manuring, and contain much useful information on the basis that "regular and systematic manuring is essential to high-class cultivation and to big profits from the cacao fields. Ohlendorff's cacao manures, we are told, have given good results in Grenada. Manure should be applied in such a manner that every feeding root, or the majority of them, will obtain plant food from it." Nitrate of soda is said to be an excellent fertilizer for the lower lands in Grenada. Basic slag and sulphate of potash go well together, mixed or applied separately, and are a splendid manure for bearing cacao. Cacao planters should carefully study these three numbers (390-392), for they certainly contain reliable information

* Price 11s. post free. See advt., p. xvi.

† See also Mr. Hudson in "The Fermentation of Cacao."

based on the practical experience of a leading planter, and are certainly the last word published on the subject. The same remarks apply to *Circulars* 393, 394, which deal equally fully and in the same up-to-date manner with diseases and pests. Congratulations are due to Mr. Malins-Smith on the quality of the information given; as the Americans say, his articles are "great," and we are very glad that the editor was able to follow up Mr. Hart's series with this one in the *West India Committee Circular*. Between the two islands, Trinidad and Grenada, planters elsewhere will have little or nothing more to learn regarding the making of an estate and the collection and preparation of the crop.

Why not apply P.R. to Tropical Commerce and Finance?

P.R. STANDS for Proportional Representation, La R.P. in French, Der Proporz in German, and many leading politicians wish to see the system adopted in England, as it has been, with great success, on the Continent. To give publicity to the matter, and to popularize the advantages of the system by listening to speeches from politicians of countries where it has been adopted, some four or five hundred ladies and gentlemen attended an international banquet in the King's Hall of the Holborn Restaurant arranged by those who believe in P.R. Capacious as that well-known hall is, so numerous was the company that the balconies had to be requisitioned to accommodate the diners, and were, in their turn, well filled. We were fortunate enough to occupy a table in the balcony facing, and almost in front of, the principal speakers, which included men of the most diverse political opinions as Earl Grey (in the chair), Lord Courtney, Rt. Hon. F. E. Smith, K.C., M.P., Mr. Philip Snowden, M.P., whilst from the Continent were M. Charles Benoist, Deputy and Chairman of the group favouring electoral reform in France; Count d'Alviella, Vice-President of the Belgian Senate; M. Georges Lorand, a Belgian M.P.; and many other leading men on both sides of the Channel.

Listening to the explanations in the speeches, we realized that we needed to apply the principle of P.R. to tropical finance as well as to home politics. Just then we noticed "Our Friend" (Mr. James R. Boosé) among the guests listening to Lord Courtney's remarks, and at once thought of the remarks we had made (see p. 230) as to the need of a larger number of the rising generation going to Latin-America to look after our (nearly) £1,000,000,000 invested out there, as, unless they go, our trade cannot derive the benefits it is entitled to, for, as we have often pointed out, as matters now stand, and tend to move in the near future, the representatives of other countries will divert (and are, in fact, doing so) the increased trade generated with our money to their own friends. If, therefore, educated men were sent out in the proportion of one to every £50,000, or even every £100,000, which we have invested south of the Panama Canal, great benefits would accrue both to those who go and those who remain at home. We therefore drank to a toast of our own, viz., to the extension in the near future of the principle of P.R. among Englishmen in connection with Latin-America and its increasing trade and prosperity.

Expectation v. Realization.

IN the prospectus of the Jamaica Copra and Estates Co., Ltd., recently published, Sir John Furley is put down as Chairman, and Mr. Henry Spearman Saunders, described as formerly Chairman of the Planters' Association of Ceylon, is a director. Among the details given, the public are told by Mr. Edwin Elliott, of Kingston, Jamaica, that "sixty nuts per tree is a low average to estimate for fully-grown, matured trees on good land near the sea, but I take it as a safe estimate. Some of the twenty-year-old trees will give 150, or even 200 or more, nuts per tree." The estate is said to contain 22,732 trees, of which 17,232 palms are seven to twenty years old, the remainder being only one to two years old.

Readers of TROPICAL LIFE will be interested to see how the above estimates work out on an estate with so few trees to start with, and how these estimates will work out "when (in spite of being) fully planted out with 48,000 coco-nut trees, and interplanted with bananas and sugar-cane." Mr. Elliott seems to estimate that the estate will produce 809,000 nuts in 1917, that is, in four years' time only. The estate, which we understand from the prospectus has, as stated, 17,232 trees of a bearing age, is estimated to give 165,000 nuts in 1914, 379,000 in 1915, 594,000 in 1916, 809,000 in 1917, with 2,850,000 as a maximum from—we take it—48,000 trees, or about 60 nuts per tree, if all are healthy and all in full bearing.

These are estimates; let us look at facts. The *Madras Mail* tells us that, according to the *Investors' Chronicle*, the last crop of "Kalkudah" Estate, Ceylon, was under 14 nuts per tree; "Juru," a Malayan undertaking, had to reduce its official estimate for 1913-14 to 750,000 nuts, against 1,000,316 in 1910-11; whilst a third undertaking, "Sempah," expected 300,000 nuts for 1912-13, but harvested only 173,734 nuts, and has now reduced its official estimate for 1913-14 to 200,000 nuts. These are facts, and we can add others. In the face of such returns, are not the Jamaica estimates a little inclined to be too optimistic?

We have taken the trouble to point this out, not from ill-will to Sir John Furley and his colleagues, but because we wish to see the public subscribe liberally to sound coco-nut investments, and any serious setback or disappointment will shake their confidence, and so stem the flow of capital at the start.

WITH regard to the rubber share market, Messrs. Zorn and Leigh-Hunt report that at the beginning of December various annual reports appeared, and in several instances dividends were passed in order to strengthen the financial resources of the companies concerned. This, of course, tends to depress the share market, and, more particularly, the passing of the Lanadron interim dividend has caused considerable disappointment. It is evident that at the present time directors all round are exercising extreme caution, and when there is the slightest doubt as to the advisability of distributing a dividend instead of carrying forward the funds in hand they are inclined to give the benefit of it to the more conservative course. While this is disappointing to shareholders, it naturally means that many companies are being placed in a sounder position than would otherwise be the case.

The Manuring of Rubber.

SOME interesting experiments were recently carried out at the Peradeniya Gardens, in Ceylon, to definitely test, if possible, the advantages of manuring rubber. In order to arrive at such a decision certain plots of Hevea rubber at the Experiment Station at Gangarooma have for several years past been manured with definite mixtures—that is to say, mixtures containing an excess of nitrogen, potash, &c.—and now that the trees have arrived at a tappable age, reports the *Times of Ceylon*, from which we borrowed some of these notes, they will be tapped shortly, one system being followed in order to determine whether manuring influences the yield of latex. That is, of course, apart from any extra growth of the tree. It might be taken as a general rule that the bigger the tree the more rubber one can take out of it. It is not universally true, but it may be taken as a general principle. The idea of these manuring experiments is to find out whether any given manure will produce an increased flow of latex, independent of the size of the tree, without, necessarily, showing a better growth.

It has already been claimed, experimenting with Ceará rubber, that potash gives an increased yield of latex within a few days. In such cases there is the direct effect of manuring on the production of latex in a time which does not admit of an extra growth of the tree—that is, the extra yield of rubber is due to the manure directly, not to the manure indirectly. Then there were the Ceará experiments, which were carried out with nitrate of soda in Hawaii, and which we have referred to on several occasions in this paper. They were not very well planned, but were carried out in a rather haphazard manner, otherwise better results would have been obtained; those registered, however, proved the stimulating effects that nitrate of soda had on the yield of latex. So far, except for these tests, which cannot be said to have been carried to any final conclusions, really no experiments have been conducted to determine the effect of manuring in the yield of latex, because to do this properly the trees ought to be grown under a system of manuring before people could experiment. That means that one must wait five or six years, probably, before beginning to tap. Experimenting in this direction was not thought of previous to four or five years ago, and Java, where such manuring experiments have been instituted, is in the same state as Ceylon, *i.e.*, just ready for tapping manured trees. Reliable information on the subject, therefore, must be looked for in the future, and not from work already done. We trust, however, that it will be in no very distant future that we shall receive the desired experience.

ECONOMIC ZOOLOGY.

Our Motto: "Utilization, not Extermination."

Wild Pigs—a Nuisance but a Profit Yields.

INDIAN PIGS' BRISTLES AT 33s. PER LB.

OUR contemporary, the *Madras Mail*, has, from time to time, particularly towards the close of 1911, called attention to the need of reducing the number

of wild pigs in the Madras Presidency, so much so that the Government at the time offered rewards first of Rs. 3 and then Rs. 5 for each wild pig killed, whilst in some districts, as on the Kotagire Hills, the demand for meat of a good wild boar made it worth Rs. 5 for the flesh. "I have just inspected a field of potatoes," wrote "Old Mac," in the *Madras Mail* of January 11th, 1912, "spoilt by a drove of wild pigs, and saw what awful destruction they are capable of in a few hours. Tons of good potatoes were eaten, and the soil was simply ploughed up as by magic . . . the pig is master of the situation, and the number is increasing." In spite of the awards and the value of the animals for their meat, according to later news an increase rather than a reduction in number seems to have taken place. "I come from the Malabar district," wrote "W. P.," also in the *Madras Mail*, "and am in a position to affirm that the real reason why the benign offer of a reward for the destruction of wild pigs is not more largely availed of than it has been, is not ignorance of its existence at all; nor is it the smallness of the reward. It is mainly the trouble to get the reward. I wish the collector of the district would cause inquiry to be made as to how often a man has to dance attendance at the Taluq Kutcherry before he can get payment. I do not think that the reward should be made to depend on the age and size of the pig." "W. P." is quite right; we would even give an extra rupee, or half a rupee, for the carcase of a young pig as a reward for having nipped it in the bud before it could have done the harm of an older animal.

Meanwhile, to encourage attention to the matter we also contributed a letter on the subject, which was published by our Madras contemporary in their issue of December 12th,* when we said: "Whether the lack of attention is due to the smallness of the award, as some suggest, or, as the Board of Revenue thinks, to the small number of people that know such a reward can be obtained, probably a very much larger number of pigs would be killed if the notices published the fact that at the bristle sales in London this month (November, 1911), long, white Calcutta pigs' bristles sold up to 27s. 6d. and even 30s. per lb. To obtain this price the bristles must be carefully washed and thoroughly dried, then assorted as to length and colour (black, white, or grey bristles must not be mixed). The different lengths and colours are then tied securely into bundles of 1 to 1½ in. in diameter, and sent over in cases of 100 to 110 lb. net each. The bristles must never be packed loose, and if the bundles become untied the value of that case is much reduced."

The above was written two years ago, but the position to-day is, we believe, unchanged on both sides of the water, except that over here the bristles sold on October 30th up to 30s. and 33s. per lb. for long, very fine whites, against the 27s. 6d. and 30s. per lb. mentioned in our letter. Surely, therefore, it must pay someone to help reduce the number of wild pigs throughout India, and, having disposed of the flesh and the skin, to collect the bristles, wash, assort, and pack them for export according to the instructions.

* The letters above quoted came after ours; they were, in fact, provoked by it, but the controversy had been going on for some time before we wrote.



"Tropical Life" Friend.—No. 102.

MR. JAMES R. BOOSÉ.

Secretary of the Royal Colonial Institute.

WE seized the opportunity offered by Mr. Boosé's return from South Africa to include him in our gallery of friends, where we know he will be immediately noted and welcomed with pleasure by all our readers.

Last year, as many of our readers know, "Our Friend" made a tour of the whole of the Dominion of Canada, and at the close of what might be termed the last session of the Institute he proceeded to South Africa in order to visit the various Honorary Corresponding Secretaries and to become personally acquainted with the Fellows in that part of the Empire. In the course of his tour he visited Cape Town, Mossel Bay, Port Elizabeth, Uitenhage, Grahamstown, East London, Durban, Pietermaritzburg, Johannesburg, Pretoria, Bloemfontein, Kimberley, Bulawayo, Salisbury, Livingstone, the Victoria Falls, &c. At each of these centres of the Institute's activities important gatherings of the Fellows and their friends were held, when their visitor and secretary-in-chief was able to explain the aims and objects of the Institute and to set forth the many privileges enjoyed by the Fellows. The mission, needless to say, resulted in a large accession of new Fellows and in the work of the Institute being better understood and much more fully appreciated than had been the case hitherto. The tour, which was in all ways a great success, was described by one of the leading journals as a special event, and as part of an organized scheme for bringing the uses and privileges of the Institute more clearly before the general public than had ever been done in the past.

For the above reasons we should be glad if in 1914 and 1915, or at any rate during the course of the next few years, "Our Friend" could undertake two more journeys of a similar nature, one to the East, especially to visit the Straits and Malaya (whether a second visit to cover India and Ceylon would be necessary we cannot decide), and another—and we hope it will be chosen as the first of the two trips—to look up the West Indies, and realize from men on

the spot, as Mr. James Bryce, Hiram Bingham, and others have done, what an enormous opening there is for individual British effort to make money (thereby increasing the trade and influence of the Empire) as traders, planters, stock-raisers, in fisheries, &c., in the republics south of Mexico. These areas may be outside our Overseas Dominions and the Colonies, but the class of men which should go, and which we need out there to build up and consolidate our interests, are just the class that pass through the Royal Colonial Institute. They believe that fortune helps those who help themselves, and turn and twist things, political as well as commercial, until they get their own way. Such men well planted out in South America would do as much good to the trade and the rising generation of Greater Britain as they would to the Mother Country. We have, of course, repeatedly urged this, and with such authorities as Hiram Bingham in his book, "Across South America," published in 1911, Mr. Bryce's "South America," which appeared last year, and this year Mr. Reginald Enoch's "Republics of Central and South America," and Mr. Domville-Fife's "Guatemala and the States of Central America," each in turn warning us not to neglect the development of these markets, but to take a hand in moulding them and directing the trade this way, we feel that if Mr. Boosé were to visit our South American possessions he might be the means of inducing capitalists to plant in and trade with Latin-America to the benefit of Great and Greater Britain alike.

Since "Our Friend" took over the reins from Mr. O'Halloran, who retired from the secretaryship of the Royal Colonial Institute in 1909,* he has had a busy time in all ways. The number of Fellows, to begin with, has increased from 4,400 to about 10,000, while the sphere or base of operations has also been considerably extended with the increasing influences and necessities of the Empire. In spite of its growth, Mr. Boosé has kept the work of the Institute right up to date, whilst being still ready and willing to engineer further developments as occasion demands. A striking instance of this and one which pleased us greatly, was the Conference on Emigration convened by the Royal Colonial Institute, largely, we believe, at the instigation of "Our Friend." We devoted the leading article of our issue of September, 1910, to the report of the important discussions that took place at this Conference, which has, we believe, resulted in far greater attention generally being devoted by the societies and authorities, as well as the general public, to the more even distribution of the Empire's children over its surface, instead of leaving a few centres with the bulk of the population, and the bulk of the centres with only a few inhabitants.

Mr. Boosé is well qualified for the important post he holds. He entered the service of the Institute in 1873, when its membership numbered 349 and its annual income was about £1,000, and previous to becoming Secretary "Our Friend" was Librarian to the Institute, and is an authority on Colonial literature and libraries; he has published several papers dealing with the administration of Colonial public libraries.

* See TROPICAL LIFE for May, 1909, p. 72, where Mr. O'Halloran figures as "Our Friend."

Business Notices.

1.—The address of TROPICAL LIFE is Messrs. BALE, SONS AND DANIELSSON, Ltd., 83-91, Great Titchfield Street, London, W.

2.—All literary communications should be addressed to the Editor, and accompanied by the necessary stamps for their return if not accepted.

3.—All business communications and payments, either for subscriptions or advertisements, should be sent to the Publishers of TROPICAL LIFE. Cheques to be crossed The Union Bank of London, Ltd.

4.—The Subscription, which is Ten Shillings per annum, may commence at any time, and is payable in advance. Life Subscription, £5.

5.—The Advertisement Department is at 112, Fenchurch Street, E.C., where all inquiries respecting advertisements, charges, &c., should be addressed c/o the Manager of the Department. At the same time will advertisers kindly note that all copy and blocks for advertisements must be sent to 112, Fenchurch Street, E.C., before the thirteenth of each month, failing which, insertion of same in current month cannot be guaranteed.

6.—Changes of address should be promptly notified.

7.—Non-receipt of copies of the Journal should be notified to the Publishers.

8.—The Journal will be issued on or about the twentieth of the month.

The Managing Director and Editor of "Tropical Life" will be pleased to consider the printing and publishing of useful technical works on Tropical Agriculture, Medicine, or other subjects dealing with the development of our Colonies and the Tropics generally.

Tropical Life.

DECEMBER, 1913.

How to Keep Up the Price of Plantation Rubber.

SELL 10 PER CENT. OF YOUR POSSIBLE OUTPUT AT 10s. LB. AND UPWARDS, INSTEAD OF 100 PER CENT. AT 1s. LB.

THE low prices now being realized even for the pick of Eastern plantation rubber, much more for the entire output of an estate, some of which sold down to 8d. lb. (see TROPICAL LIFE for September, 1913, p. 179), in spite of the time, trouble, and expense incurred to prepare it for market, are in striking contrast to that being paid for Amazonas *pelles** prepared in a far more happy-go-lucky and less expensive manner, and reminds one of a man trying to produce bananas in glass houses in the Tropics, as pine-apples are grown in the Azores, and then expecting, not only to successfully compete against growers in the open who have far less expense to put up with, and can therefore be satisfied with lower prices, but even to obtain higher prices because of the heavier cost of production incurred by his more elaborate methods.

Again, the present crisis—for crisis it undoubtedly is to many estates—causes the question to be once more asked: Why will the East persist in sending its odd lots and many shades and qualities of rubber to be marketed, instead of standardizing the rubber and shipping it to a recognized and well-known type, as the rubber exporter along the Amazon has always done, be the rubber from Brazil, Colombia, Peru, or Bolivia, and whether it passes through German, English, French, American, or other hands? Why will

the scientific and highly organized English producer in the East ship rubber that those who use the bulk of the articles manufactured from it do not want, as they prefer goods made from the South American rubber because they know exactly the percentage of wear and tear to allow for, and therefore how long the articles made from it will last? How often have manufacturers of goods in Sheffield, Birmingham, and elsewhere in England been twitted for insisting on sending to the Tropics and the Colonies the goods that they (the makers) want to sell, because they are all that the machinery at their disposal can turn out, and for having refused, or at least demurred at sending what their customers abroad really want, and often must have, taking into consideration the peculiar conditions under which they work. Are not the tables being turned for once? Do not present prices (3s. 9d. lb. for hard fine against 2s. 6d. as the top price for Eastern plantation as on September 17th and 18th) show that it is the Colonies in this case that *will* send to the manufacturers what they (the producers) have to sell and not what the consumers, *i.e.*, the rubber manufacturers, prefer, and must have? Do you doubt this? If so, can you suggest a better explanation as to why Brazilian rubber with at least 10 per cent., and probably 20 per cent., of water sells from 3s. 3d. lb. for soft cure up to 3s. 9d. lb. for hard, and that, too, I believe, for the best part of the entire output of 32,000 tons (Pará only, 1912-1913 shipment), against the 8d. to 2s. 6d. lb. realized at the same time for the so-carefully prepared Eastern kinds?

The cause of this perversity is not far to seek. Up to now the fancy rubbers from the East have paid, and paid well, but to-day the supplies of that class of raw material have already considerably exceeded the demand and, unless a change is speedily made, they will continue to exceed the requirements of the manufacturers to a degree that will be ruinous for the producers. It is true that when these fancy rubbers first came to market, and especially when shown at the rubber exhibitions of 1908 and 1911, they undoubtedly caused manufacturers to realize that there lay before them the possibilities for opening up new lines of goods where a colourless or light amber rubber was needed. Such lines, however, have their limitations, and with the increased output of such cures from the East (an output, as regards quantity, which we feel sure all are glad to see, and wish "long life" to) these limits have been reached and exceeded, so that such rubber is no longer appreciated at its former value, and to sell the entire output against the Brazilian kinds, much lower prices, comparatively, have to be accepted.

The same occurred and is still going on with cacao. The premium on fine cacao, especially choice Venezuelan, is diminishing, so that whilst good to fine Grenadas and Trinidads used to be 20s. to 30s. behind the old "Superior" Trinidad marks "San Antonio" and "Soconusco," Grenadas are now selling at 66s. to 68s. for the best marks, and good to fine Trinidads 74s.* to 76s., whilst the above two Superior marks sell for so little, if any, more, that one no longer talks of the price they realize. One of the essayists in our book on "The Fermentation of Cacao" also remarked on this, and there is no doubt that, were the output of

* A *pelle* is, of course, the well-known ball or ham of rubber with the round hole through the centre, which are shipped loose from Brazil.

* This article was written at the beginning of September.

choice Puerto Cabello, Cauca Valley, Nicaragua, or similar kinds to be increased four-fold, this increase would drag down the price to such an extent that they would probably sell no higher than fine Ceylons or Javas, and all such kinds would, as supplies grew, gradually drop to the level of the less delicate *Forastero* or Trinidad and Grenada types. The value of a commodity is fixed in proportion to its utility, and hence demand, and never was this more plainly demonstrated with cacao than at the close of 1907, when common grades of any kind sold at 122s., whilst choice varieties, generally worth two and three times the value of these common sorts, were passed over as unsuitable, and when sold at all they fetched a lower figure than their plebeian competitors. As with cacao, so it is, and ever will be, with rubber; so long as the fancy cures were scarce, they had the advantage on their side, but as soon as the supply exceeded the demand their very delicacy and superiority began to tell against them, as, outside their own particular clique, they were neither appreciated nor valued. No longer in the enjoyment of a premium, if the existing ratio of increase in the output continues their present reduced value compared to Brazilian *pelles* will be further aggravated. This is a democratic age in agricultural outputs, as in matters political and commercial, and, at any rate for the time being, it is always the more refined who suffer at such times.

This, we believe, is what troubles the East, and the remedy is neither far off nor troublesome to secure. We say this because rubber estates are singularly fortunate when holding back their crop, so long as this is done by leaving the latex in the trees. Unlike cacao, coffee, cotton, &c., the crop when ready need not be gathered, and furthermore, the trees benefit when this is not done, as the enforced rest strengthens them and, at the same time, improves the globules in the latex, and increases the yield when tapping is carried out later on. Again, with the other estates mentioned, those which produce fancy qualities cannot change the grade or make any alteration in the quality unless the whole estate is replanted; and even then, we believe, with cacao at least, local peculiarities of soil, or through hybridization or other causes, the beans would in time tend to revert to the very quality you wish to get away from. But with latex, once the trees are comfortable and well looked after, any kind of raw rubber can be turned out, the thinnest and whitest crêpe, or the finest "hard," so long as those handling the rubber know their work. This being so, and if buyers prefer smoked rubber in *pelles* with 10 per cent. to 25 per cent. of water thrown in, and are willing to pay 40 per cent. more money for such compared with the almost stone-dry Eastern kind, why not give it to them, especially as when prices are low, and importers want to hold up their rubber, the *pelles* alone can be relied on to last unimpaired in quality? The day the fashion changes, so can your method of curing; meanwhile rubber made on the Amazon principle costs less to cure and weighs more. One of these days the latex will be smoke-coagulated in bulk, and then be drawn out through a number of apertures or slits in the form of thin crêpe, carried through a tunnel-shaped shed long enough for it to be partially smoke-cured and toughened; at the end of this the strips of crêpe to the number of six, ten, twenty, or as desired, will be run

through a pair of heavy rollers and emerge in the well-known blanket form. This, in its turn, will be caught up and carried along under fairly strong tension until, now edge-wise, it reaches a rotating spindle round which it will be rolled as tightly and closely as possible until—lo! and behold—you have an unmistakable *pelle* as those from Brazil, made of a continuous strip of rubber tightly wound round and round (you would require fairly thick blanket to do this, in order to have the necessary strength) until about 56 lb. has been rolled off. The *pelle* is then replaced by another spindle and, removed from its own, is placed in a strongly-made mould, lemon or other shape, inside, and left under heavy pressure long enough to ensure its being one compact whole, and, in every way, similar to and as good as its troublesome competitor from the West. All would be easy, simple, and labour saving, hence inexpensive. You pour in the latex at one end (say into one or other of the patent smoke-coagulating machines), and you hitch off the finished *pelle* at the other; between the two, except for turning on the smoke, or joining together a crêpe ribbon that had got ruptured *en route*, the less the rubber is touched by hand the cleaner and better the quality and the lower the cost.

But that is a diversion, one that would be inexcusable were this not a Christmas Number, wherein one is allowed to dream dreams a little, and take one's readers off the beaten tracks for a change. Going back to the low prices now ruling for Eastern plantation, as already stated, we do not consider the remedy to be a difficult, much less an impossible one; it will neither add to the troubles of the manager, nor increase the expenses of the already overburdened finances. Far from adding to the directors' troubles, I believe on the contrary the remedy we are about to suggest will first of all lessen, and finally cause the total disappearance of the present anxiety. If this is so, the present crisis will have proved but a blessing in disguise. One thing, and one thing only is necessary, and that is co-operation on an organized basis between the various Boards, especially those of the dominating syndicates.

"Standardize Eastern rubbers," clamours number one set of critics. "Sell through central agencies," implores a second. "Restrict the output," suggests the third. "Do not ship such small and mixed parcels," writes out a fourth. "Let us valorize the total rubber output," advises the fifth. We agree with all of them, including even the last, if the valorization follows our scheme of restricting the output, that is of storing up surplus crops in the shape of latex in the trees, and not as cured rubber in the warehouses.

If there is one industry in which deferred crops are not only safe, but are actually improved in quality and increased in quantity by being kept back, it is that obtained from the latex of the rubber tree, at least from *Hevea brasiliensis*. Not only is the capital invested in a well-managed rubber estate safer than in most other agricultural industries when passing through periods of acute crisis, but, as just stated, delaying the crop is an advantage, not a drawback, and this fact enables us to advise that the output be curtailed and prices raised to any level desirable by the following methods.

Supposing the East with its estimated 112,000,000 trees gave, at 2 lb. a tree, two million cwts. or 100,000

tons of commercial rubber by 1920 (it is not going to do so, but the exaggerated output will emphasize what we have to say). If this quantity, with 40,000 tons from the Amazon, caused rubber to drop to 1s. lb. (even 6d. lb. if you like), what would happen to the trees if the syndicates, by that time carefully organized and working in co-operation for self-defence, suddenly passed round the word, "Produce only 10 per cent. of your possible output this season"? Would it not benefit them by the rest? On the other hand, what would be the result to the shareholders—would it further add to their losses? Not a bit of it; such a course would be their only chance of securing their capital, and receiving dividends, and for these reasons:

Such a curtailment of output would mean that the East as a whole would ship only 10,000 tons of rubber, and the manufacturers, after being trained up to need 140,000 tons of raw rubber a year, would only get 50,000 tons, or just one-third. Is such a result impossible, or even difficult to bring about, once the organization is there to pull the strings? If arranged, especially if arranged quietly, the shock to the market would make prices run up to any level short of bankruptcy to the buyers (for that must not be allowed), or of the price-paying capacity of the public. It certainly would make prices run up to 10s., 12s., even 20s. lb., causing the estates and their shareholders to realize as much as or up to double the amount of net proceeds for only 10 per cent. of their output, costing, be it remembered, but one-tenth the amount to place on the market that they would have incurred had they shipped the whole crop, whilst all the time the trees would benefit by less tapping, and, whilst storing up larger yields of stronger rubber for the future, they would live longer and yield more freely from being less called upon for latex. Such a sharp curtailment of output would not be necessary, unless as a start, but 50 per cent., 30 per cent., even a 10 per cent. curtailment would make all the difference. To continue, however, when stocks are already accumulating and overdone, to put out a further 10 per cent. or 20 per cent. increase would mean to run down the value of the entire output in a manner that would be, to say the least of it, quite suicidal. Such a scheme as we have suggested as a remedy to this, if carried out in moderation, would not be prejudicial to the large manufacturers; they would, on the contrary, we believe, support it so long as it was only used to enable the estates to pay remunerative dividends, and to keep prices at a fair and, above all, at an even range of values, free from the violent fluctuations of recent years. Once let prices go down to 1s. 6d., much more to 1s. lb., for any lengthy period; so low a cost for raw material would bring into existence a host of small competitors that would take all the profits from the older and larger houses when prices were down, but who would go bankrupt, or otherwise fail the public with their competition, were rubber to jump up in price, and they had not the means to continue. This occurred with cacao, and it is not beneficial, either to the public who buy or the manufacturers who sell, that it should be so, for in the end only a few very big houses survive; and these dominate the market; whereas with more regular prices this need not be. Better to have fifty reliable makers than five very large, or five hundred small ones.

Whether the West would join in with the East or not we do not pretend to say. It would be fairer were they to do so, but the East is independent of the West, and though, of course, the South American would be an enormous gainer by such tactics on the part of his Eastern competitor, their holding aloof need not keep the Eastern planters from benefiting themselves, even if they had to benefit (unfairly to themselves) their competitors at the same time.

Little estates again, it may be urged, might break through the agreement, or never enter into one, but such details need not trouble the big concerns; retribution would soon follow. The syndicates or co-operated boards need only form a fund to buy up these smaller fry cheap when the day of trouble comes, and so maintain complete control of the market. We do not fancy, however, there would be any hesitation on the part of individual estates to join in, once it was made clear to the shareholders and their directors that they ran serious risks of being squeezed out of existence if they remained outside.

Tobacco Planting.

PART I.—GENERAL NOTES.

As promised in a previous issue when we discussed the wicked ways of the Tobacco Fungus, we have prepared a series of articles on tobacco planting, which we hope will fill the gap that confronts so many of our readers who wish to take up the cultivation of tobacco, either as their main crop, or as a subsidiary industry, until the much-needed handbook appears.*

There are, of course, many kinds of tobacco grown, each suitable for a particular purpose or market, but as we are publishing these notes to please the largest number of readers we cannot, at any rate at the start, cut it up into sections, as we should have preferred, taking coarse kinds first, then improved varieties of leaf, fillers, and so on, but must bulk all kinds together more or less, whatever system we may adopt later on.

In September, 1911, the Ceylon Tobacco Committee published over the signature of Dr. J. C. Willis, then Director of Agriculture out there, a leaflet on the possibilities of growing tobacco for the European market. A coarse class of tobacco had for long been cultivated in the Jaffna district for export to Travancore, but as this was entirely unsuited for European palates, the aim of the experiments to be carried out was to produce Jaffna leaf fit for European consumption by an improved method of curing; at the time the attempts were not carried to a successful issue. The publication of our "Fermentation of Cacao," with its comparative notes on the fermenting of tobacco, will, we hope, be found of use should a similar case arise, whether in Ceylon or elsewhere. Cuban leaf planted at Jaffna proved, it was considered, too small and delicate for local culture. One trouble encountered

* Our publishing department will be pleased to consider authors' MSS. with a view to publishing books on Coffee, Tobacco, or Sisal Planting, providing they cover the ground generally, and are not confined to any single centre.

during the Ceylon experiments was a searching wind that prevailed during a season when the atmosphere was as dry as possible, there even being practically no dew at nights, with the result that it was impossible to put the cured leaf into the staple in a sufficiently damp condition for any sort of fermentation to be set up. According to Harper,* there are more than one hundred varieties of tobacco in cultivation, among the leading ones grown in America being White Burley, Zimmer Spanish, Cuban, Orinoco, Connecticut Seed Leaf, Yellow Pryor, Havana Seed Leaf, and Sumatra Seed Leaf. The variety of the tobacco grown in a given locality depends upon the type of the soil in that locality, and no plant is so affected by different types of soils as the tobacco plant; the effects (of the soil) on the leaf, however, will be discussed more fully later on.

In Rhodesia, we understand, the Tobacco Company of Rhodesia, Ltd., has been working to encourage those whose capital is limited to take up tobacco planting, by undertaking to grade the leaves, cure them to suit the various uses they can be put to, and sell them by auction. New plantations are being opened up with Turkish and Virginian leaf cultivation, and the soil and climate are considered ideal for further extension of these lands.

Coming to the question of the cost of laying out an estate, those outside India may still like to compare the following, which comes from the *Indian Planters' Gazette*, with their own costs or estimates:—

Rs. 60 may be taken as the average cost of cultivation for one acre of land in Tirhoot. In Bengal proper, where labour is dear, the actual cost for cultivation is considerably higher, but they do not spend much in nipping, pruning and weeding. A statement of costs per acre in Tirhoot is given below:—

			Rs.	A.	P.
(a) Ploughings 12 times, requiring three ploughs each time at 4 annas per plough	...	...	9	0	0
Seedlings	...	...	2	0	0
Planting—24 men at As. 2.6 per head	...	...	3	12	0
First <i>keroni</i> (weeding with <i>khurpi</i>), 30 men	...	...	4	11	0
Second <i>keroni</i> , 20 men	...	...	3	2	0
<i>Murhi</i> (boring the top of the plant. In other parts of this Province the top of the plant is nipped off, requiring only 2 men) 10 men	...	...	1	9	0
Pruning off-shoots—30 men. (6 times 5 men each time)	...	...	4	11	0
Total	...	...	28	13	0
(b) Manuring—					
Twenty cart-loads of farm-yard manure, at As. 8 a cart load	...	...	10	0	0
Cart hire	...	...	2	8	0
Applying manure—4 men	...	...	0	10	0
Total	...	...	13	2	0
(c) Harvesting—					
Cutting—5 men	...	...	0	12	6
Drying—10 men	...	...	1	9	0
<i>Cheras</i> (separating leaves from stems) and tying—20 men	...	...	3	2	0
Total	...	...	5	7	6
(d) Rent	...	...	12	0	0
Grand Total	...	..	59	6	6

* "Syllabus of Illustrated Lecture on Tobacco Growing." By J. N. Harper, Director Agricultural Experiment Station, Clemson College, S. Car., U.S.A.

OUT-TURN AND VALUE.

The average yield per acre in different tobacco-growing tracts is, roughly speaking, similar, as the tobacco lands are highly manured everywhere. In Tirhoot an out-turn of about eighteen maunds is obtained per acre. In the Terai side, where the soil is exceptionally fertile, the yield is a little heavier. The fields highly manured with indigo refuse produce four or five maunds more of cured *murhan* tobacco.

	Mds.
(a) Out-turn (common)—Cured tobacco of the first cutting, called <i>murhan</i>	12
Cured tobacco of the second cutting, called <i>dunji</i>	4
Dried bottom leaves rejected at the topping operation, called <i>feri</i>	2
Total	18
(b) Value—	Rs.
The value of the <i>murhan</i> tobacco—12 maunds at Rs. 6 per maund	72
(Average price of this quality is Rs. 8 per maund.)	
The value of the <i>dunji</i> tobacco—4 maunds at Rs. 1.8 per maund	6
The value of the tobacco of the bottom leaves (<i>feri</i>)—2 maunds at Rs. 1.8 per maund	3
Total	81

Labour-saving Machinery and Implements in India.

How often have we been told by leading firms making sugar machinery, ploughs, irrigation machinery, mechanical traction, spraying machines, &c., that India is "no good" as a market, and is not worth a thought as a coming centre that will buy labour-saving appliances, since the labour there is so cheap that no machinery can compete against the human machine, and so sales, worth troubling about cannot possibly result? When replying to such criticisms we show what the various agricultural colleges, the departments of agriculture, as well as individual action, Indian and European, are doing, and how foolish it is for those firms who wish to push on and increase their connection and sales to ignore so important a centre as India. Until lately our efforts have met with little or no success; but to-day the leading manure interests are carrying on vigorous campaigns throughout the whole of the Empire, and Southern India, to say nothing of the tea gardens in Assam and elsewhere, is buying more spraying machines at the present moment than any centre we know of, orders for fifty and one hundred machines at a time being constantly sent out, and received by those who have been wide-awake enough to nurse India during the last three or four years.

Now we are glad to see that the *Indian Planters' Gazette* supports us in our contention that "the idea that the Indian will not use agricultural machinery is one that, along with many others concerning farming in this country, must be given up before many years are over . . . the Agricultural Department has been planted among them, and is doing a great work in educating them up to the standards of the West, and, though the people are responding slowly, so much success is following their efforts that it may be taken as certain that the progress begun will gather strength,

and in due time surprise the ancient prophets who held and preached that scientific agriculture in India was a thing beyond attainment." The old order of things must change, that is the verdict, and it is for English agriculturists *plus* the makers of the labour-saving appliances to hurry the current that still tends to flow rather too slowly in their direction, and "to step in and seize the rewards which it is now obvious must follow the introduction of scientific agriculture into the country." Such a time is close at hand, for the leading authorities have stated that "for any operation which can be performed with mechanical power, bullock power or hand labour is an exceedingly expensive source of power."

On this side also our advertisers are more alive to the advantages and the possibility of India as a market for their goods. "Have you a good circulation in India?" "Are your readers influential enough to educate others up to the advantages of using up-to-date machinery?" "Was it not your editor who wrote to the *Times* last year that 'If you wish to raise a people, especially agriculturists, in the Tropics, by improving its methods of cultivation and commerce, you must work downwards from a class where the conversion can be made thorough and assured. . . . Acting on the principle that example is better than precept, let us show the natives . . . how to get the largest and most remunerative crops'—for, if so, then we will come in?" These are the questions we are now asked week by week, and as those who have been asking them have come in, our readers and would-be advertisers can realize how satisfactory were the answers we have been able to give.

Meanwhile, in support of our suggestion in the *Times* referred to above, the *Indian Planters' Gazette* tells its readers:* "If the Agricultural Department were strengthened, and if a reasonable proportion of the agricultural business of the country were in European hands, progress would be rapid. . . . There is a distinct move being made to at least try if a fortune cannot be made out of the land in India as surely as it is in Canada and Australia . . . there is some promise of even being able to introduce threshing and winnowing machines successfully. . . . A machine of Messrs. Ransome, Sims and Jefferies exhibited and shown at work at the Allahabad Exhibition has been altered and improved to suit local conditions. The machine was sent round neighbouring villages in rotation, and a charge made of 4 annas (4d.) a maund (82 lb.) of grain threshed, which was gladly paid." There is no need for the engine to be idle during the ten months of the year when it is not needed for working the machine; it can pump, crush cane, grind flour, gin cotton, &c. Those who have seen this machine agreed as to its benefits, such as its being able to free a larger number of men to work the land when the threshing was being done; the machine needs no animals to work it which are liable to rinderpest or foot-and-mouth disease. With this machine (as with many others that will soon find their way out there) to thresh and winnow his grain and a pump to lift his irrigation water, the farmer's portable engine can be constantly employed, and he will save money all along the line.

* See their issue of November 1st, first page, on "Agricultural Machinery in India."

Coco-nut Products, &c.

ACCORDING to Messrs. Mordaunt Bros., Cochin coco-nut oil at the beginning of December was neglected, but Ceylon had been dealt in afloat at prices favouring buyers, quotations for Ceylon ruling at 45s. 6d. to 45s. 9d. c.i.f. terms. The value of pressed oil is nominal. Palm kernel oil is lower by 5s. to 7s. 6d. a ton, but the reduction has not increased the demand, which is poor. Quotations run at 44s. 9d. f.o.b. Hamburg, January-June shipment.

Prices generally on December 6th were:—

Palm oil (Liverpool):		1913	1912	1911
Per cwt.				
Lagos	... 33s. 6d. to 33s. 9d.	30s. 6d. to 30s. 9d.	29s. 6d.	
Benin	... 30s. 9d. to 31s.	28s. 3d. to 28s. 6d.	28s. 6d.	
Congo	... 27s. 3d. to 27s. 6d.	25s. 9d. to 26s.	27s.	
Bleached	... 33s. 9d. to 34s. 6d.	32s. 9d. to 33s. 6d.	32s. 6d.	
Clarified	... 29s. 9d. to 30s. 3d.	28s. 9d. to 30s.	29s. 6d.	
Palm kernel oil	44s. 9d.	37s. 9d. to 38s.	38s.	
Coco-nut oil:				
Cochin	... 58s.	46s. to 47s.	45s. to 47s.	
Ceylon	... 48s.	40s. 6d. to 41s.	42s. to 44s.	
English pressed	44s. 6d.	36s. 9d.	36s.	
Copra oil:				
Ceylon	... 49s.	None	38s. to 40s.	
Cochin	... 54s.	None	42s. to 44s.	

According to the *Public Ledger*, values run as under:—

Soya Oil.—Hull: Naked Extracted all positions, £26 10s. Oriental (in cases), November-December, December-January, January-February, £26 7s. 6d. c.i.f.; February-March, March-April, £26 12s. 6d.; April-May, £26 15s. c.i.f. Antwerp.

Coco-nut Oil.—Ceylon spot, £48; October-November, £46 2s. 6d. c.i.f.; November-December, £46 2s. 6d. c.i.f. Cochin spot, £58; November-December, £49 10s.; January-February, £49 5s. c.i.f.

Palm Oil.—Lagos on spot, £36.

Palm Kernel Oil.—December, £44 10s.; January-March, £44 10s. f.o.b. Hamburg.

Soya Oil Beans.—Parcels spot, £8 7s. 6d.; November-December, £8 7s. 6d.; December-January, £8 5s.; January-February, £8 5s.; February-March, £8 5s.

Linseed Cakes.—London made, £7 10s. to £7 15s.

Cotton Cakes.—London made, £5 6s. 3d. to £5 7s. 6d.

Copra quiet. Malabar, October-December, £32 15s. buyers, and January-March, £32 10s. sellers Hamburg. Ceylon, October-November, £32 buyers, and November-December, £32 Hamburg. Java, August-October, £31 5s. buyers; October-December, £31 2s. 6d. sellers, and January-March, £31 Holland, Hamburg, and Bremen. Macassar, August-October, £31 buyers; October-December, £30 17s. 6d., and January-March, £30 15s. buyers Holland, Hamburg, and Bremen. Singapore, October-November, £31 7s. 6d. sellers, and November-December, £31 6s. 3d. Hamburg. Cebu, November-December, £31 2s. 6d. sellers, and December-January, £31 Marseilles. South Sea Island, September-October, and October-November, £30 15s. sellers London. F.M. Straits, October-November, £31 2s. 6d. sellers Marseilles; October-November, £31 2s. 6d. buyers Odessa. Manila, October-November, £31 sellers; October-December, £30 17s. 6d., and December-January, £30 12s. 6d. Marseilles. Mixed no Padang, October, £30 15s. sellers.

Cotton.

THE following were the prices for Cotton in London on December 6th, according to Messrs. Slann and Davies :—

	Good—Fair.		Good.		Fine.		Superfine.	Good, 1912.		Compare Good, 1911.		per lb.
	d.	d.	d.	d.	d.	d.		d.	d.	d.	d.	
Surat kinds *	5 $\frac{1}{8}$	to 6 $\frac{1}{8}$	6 $\frac{3}{8}$	to 6 $\frac{5}{8}$	6 $\frac{7}{8}$	to 6 $\frac{1}{2}$	—	6 $\frac{1}{8}$	to 6 $\frac{5}{8}$	4 $\frac{1}{8}$	to 5	—
Madras	6 $\frac{5}{8}$	to 6 $\frac{3}{4}$	6 $\frac{1}{8}$	to 7	—	—	—	5 $\frac{5}{8}$	to 6 $\frac{9}{8}$	4 $\frac{3}{4}$	to 5 $\frac{1}{4}$	—
Bengal	—	—	5 $\frac{5}{8}$	—	5 $\frac{7}{8}$	—	6	5 $\frac{9}{8}$	—	4 $\frac{3}{8}$	—	—
Assam	—	—	5 $\frac{7}{8}$	—	6 $\frac{1}{4}$	—	6 $\frac{1}{2}$	6	—	4 $\frac{5}{8}$	—	—
China	—	—	6	—	6 $\frac{5}{8}$	—	6 $\frac{1}{8}$	6	—	5 $\frac{1}{2}$	—	—
West Indian	7	—	7 $\frac{1}{2}$	—	8	—	8 $\frac{1}{4}$	7 $\frac{3}{4}$	—	7	—	—
Sea Island	12 $\frac{1}{2}$	—	15	—	18 $\frac{1}{2}$	—	22	15	—	13	—	—
West African	6 $\frac{1}{8}$	—	7 $\frac{3}{8}$	—	7 $\frac{9}{8}$	—	—	6 $\frac{1}{8}$	—	5 $\frac{1}{8}$	—	—
East	7 $\frac{1}{4}$	—	8 $\frac{1}{8}$	—	9 $\frac{7}{8}$	—	—	8	—	6 $\frac{3}{8}$	—	—

* Liverpool quotations.

The spot demand has been better this week; this, combined with some smaller estimates of the crop, has stimulated the price of "Futures." These are 16 to 17 points dearer, although dealings are very restricted. In East Indian very little business is doing. Silver is quoted at 26 $\frac{1}{8}$ d. per oz.

The import into Liverpool this week amounts to 170,524 bales, since September 1st 1,531,637, same week last year 240,543, last year's total 1,779,594 bales. The estimated Sales amount to 57,000 bales, including "called." Middling American is quoted at 7.33d. per lb., last year 6.97d., 1911 5.04d.

Movement of American Cotton since September 1st :—

	1913-14.	1912-13.	1911-12.	
Brought into sight	7,319,000	7,157,000	6,944,000	bales
Exports from United States since September 1st—				
To Great Britain	1,393,000	1,761,000	1,660,000	—
To Continent, &c.	2,287,000	2,020,000	2,027,000	—
Total crop	—	14,167,000	16,138,000	—

Latest quotations of Americans for delivery, basis Middling, any Port, G.O.C. :—

	December 5th.	Same time 1912.	Same time 1911.	
December	7.03 $\frac{1}{2}$	6.67 $\frac{1}{2}$	4.90 $\frac{1}{2}$	per lb.
Dec.—Jan.	7.00 $\frac{1}{2}$	6.66 $\frac{1}{2}$	4.90	—
Jan.—Feb.	7.00	6.65	4.91 $\frac{1}{2}$	—

Coffee.

By Messrs. C. M. and C. WOODHOUSE.

THE small supplies offered at auction during the week ending December 6th met with a quiet demand and realized about previous rates. The stocks in the principal ports of Europe on December 1st, according to Messrs. Düüring and Zoon, show an increase for the month of 510,000 bags, against an increase of 305,000 bags at the same time last year, whilst the visible supplies show an increase of 371,000 bags, against an increase of 179,000 bags in 1912. Owing to heavy receipts and lower foreign advices, "futures" have declined, and the closing price of March Santos shows a decline of 1s. 9d. for the week. We quote :—

		To-day	Nov. 27th, 1913
London	Santos, Mar. del.	46s. 6d.	48s. 3d.
New York	No. 7 Rio	9.48 cents	10.06 cents
Hamburg	Santos	52 $\frac{1}{4}$ pf.	54 pf.
Havre	Santos	63 $\frac{3}{4}$ francs	66 $\frac{3}{4}$ francs

The receipts at Rio and Santos from July 1st to

December 3rd, 1913, were 9,361,000 bags, against 7,994,000 bags, and 9,021,000 bags in the two previous years respectively.

Sales include the following, viz. :—

Java.—At 46s. to 50s. 6d. for Robusta, 91s. for fine bold bright yellow Liberian.

Nyasaland.—At 65s. 6d. for smalls, 75s. for middling, 81s. 6d. for bold.

Mombasa.—At 70s. per cwt.

Costa Rica.—New crop at 59s. for smalls, 79s. for second size, 89s. for good bold.

Vera Paz.—At 68s. for fair smalls, 62s. 6d. to 73s. 6d. for small to middling greyish damaged.

Colombian, &c.—At 68s. 6d. for smalls, 73s. to 75s. for low middling, 76s. to 82s. for bold.

Dumont Santos.—Unwashed at 50s. for smalls, 52s. 6d. for medium, 65s. 6d. for bold.

The London Terminal Market has been spasmodic, being chiefly governed by the Brazilian receipts and fluctuating foreign advices, and after a moderate business the close is quiet at last week's prices to 3d. under. December sold at 45s. 3d. to 44s. 9d.

Sugar.

THE beginning of December, report Messrs. C. Czarnikow, Ltd., found the market in the same dull state that it had been during the previous two weeks, and a further slight decline has been established, caused not so much by larger offerings as by the entire indifference of buyers both for raw and refined sugars. If we look at our imports during the last month the explanation is easy, as we have received a good deal more than our requirements; when the Board of Trade Returns are issued it will be shown that our imports aggregated in November nearly 190,000 tons, being 96,000 tons raw and 94,000 tons refined sugar—rather a large quantity, as the country started with ample supplies compared with former years.

May and August Beet, which closed last week at 9s. 8½d. and 9s. 11d. respectively, are quoted to-day 9s. 7¼d. and 9s. 9½d., the decline being perhaps accentuated by the settling of a rather large December position, which was only partly transferred to forward deliveries. A great deal was liquidated down to 9s. 1½d., against 9s. 4d. a week ago. Prices are undoubtedly moderate now, and capable of improvement; unfortunately, supplies have come in at far too rapid a rate to be dealt with advantageously, and we may therefore suffer from inactivity for some time yet, unless some unforeseen cause suddenly should change the outlook. A new feature is the offering of small parcels or raw and refined Beet from Italy, in which country there appears to be a considerable surplus.

The American market has been easier, and brings Cuban sugars for distant deliveries rather nearer to European parity. The spot quotation has been maintained at 3.61 cents, whilst new crop December Cubans have been sold at 3.51 cents and first half January at 3.45 cents in fairly large quantities. In the Island eight factories are now in operation, and, so far, the prevailing conditions are reported favourable to the growing crop. In some quarters a crop of fully equal to last, or even slightly more, is expected, the damage done by the drought having been made good by the better weather conditions since experienced; at the present time it is, of course, too early to speak decidedly as to yield, as many things can happen to upset these fresh anticipations. There may be more Cubans and less Javas, also more non-Convention Beet, but the principal uncertainty prevails on the subject of consumption and exports elsewhere, which would not be covered at last season's figure, and which are expected to fall off considerably.

The American market has been quiet; business has been done in Cuban sugars for December shipment at 2½ cents, and for first half January at 2⅝ cents. The spot quotation remains nominally 3.61 cents = 10s. 3d. to 10s. 3¾d. c.i.f. New York, or 10s. 7½d. to 10s. 8¼d. c.i.f. United Kingdom. In the United Kingdom transactions in refining grades of cane sugar have again been on a limited scale, and the tone is rather easier. Grocery Crystallized is slow of sale, and prices are mostly a little lower. As regards cane-producing countries there is no fresh news to report.

With British West India sugars, the total trans-

actions for the week ending December 6th amounted to about 4,000 bags, and included Crystallized Demerara, low middling yellow small grain at 13s. 10½d. to 14s. duty paid; good middling yellow, 14s. 7½d. to 14s. 9d.; good yellow, 15s.; good bright ditto, 15s. 6d.; fine yellow and pale, 16s. 3d. to 16s. 6d. Syrups (544 bags), fine strong brown, 11s.; good middling soft yellow, 13s. Crystallized Barbados, low greyish, 13s. 3d.; low brownish yellow, 13s. 6d.

Of foreign kinds, of some 1,742 bags Crystallized Surinam, about 300 bags sold, low grey at 13s. 6d.; middling to good middling yellow, 14s. 3d. to 14s. 6d.; 275 bags syrups, all sold; fine brown and low yellow, 11s. 3d. to 11s. 9d. duty paid. No business is reported from Liverpool.

REGARDING coco-nut oil, Messrs. Goodlake and Nutter report that the market is very quiet and there has been a certain amount of Ceylon oil arrived in the river without a home, for which 45s. 6d. to 45s. 7½d. has been accepted. Forward positions, however, are practically neglected. On the other hand, sellers are holding for their own prices. We quote November-December, December-January, and January-March, 46s. 1½d. to 46s. 3d. Cochin inactive, with practically no inquiry. We quote November-December and January-February, 49s. 6d. Palm kernel oil, in sympathy with kernels, is rather easier again, and there are sellers of January-March at 44s. 6d., and same price would be taken for December f.o.b. Hamburg. Pressed oil: There is a little inquiry, but buyers' ideas are much below those of sellers. We quote sellers, 46s. 10½d., buyers 46s. 4½d. f.a.s. London in Ceylon casks. Spot prices: Ceylon, £48 to £50. Cochin, £58 to £60.

The India-rubber Market.

“BYRNE” SMOKED MALAYAN SELLS UP TO 2s. 5½d. LB.

UP at Liverpool the Pará market has been firm during the week, and prices of hard fine have advanced 1½d. per lb. Values at the close are: Hard fine spot, 3s. 2¼d.; December-January, 3s. 1¾d.; January-February, 3s. 1½d.; soft fine, December-January, 2s. 8d.; scrappy Negroheads and Peruvian Ball, 1s. 11d. per lb. Medium Brazilian grades have met with a little more inquiry, and about 15 tons of Manicoba sold at 1s. 1d. to 1s. 5½d. for fair to prime quality, and 15 bales of Mollendo sheet at 2s. 3d. per lb. The African market has been steady, and the sales reported amount to 35 tons, including Benin lump, 1s. 3½d.; white Lahou niggers, 1s. 6½d.; Loango ball, 1s. 7d.; Gambia niggers, 1s. 3d.; Accra paste, 9d.; Rio Nunez niggers, 2s. 3½d.; Conakry sheets and strings, 1s. 11d.; selected Lagos lump, 1s. 3d.; and pasty Gold and/or Ivory Coast lump rejections at 11d. per lb.

In London, according to Messrs. S. Figgis and Co., there was good competition at the first sales in December, and the whole 1,120 tons of Eastern Plantation were disposed of at prices which showed a fall from last auctions of 2d. to 2½d. per lb. Against prices quoted below Standard Crêpe are worth 2s. 3¼d.,

Hard Fine Pará 3s. 2d., Soft Fine 2s. 7d., Caucho Ball 1s. 11½d.

The sales consisted of:—

Malaya (942 tons).—Crêpe, fair to fine pale, dull to good palish, 2s. 3d. to 2s. 3¾d.; light brown and grey, part streaky, 2s. 2½d. to 2s. 3¼d.; fair to good clean brown, 2s. 0½d. to 2s. 2¾d.; dark and specky brown, 1s. 8¾d. to 2s. 1½d.; dark and black, part pressed, 1s. 8½d. to 1s. 11½d.; dark and black, inferior, 1s. 5½d. to 1s. 7d.; dark to good smoked, 1s. 10d. to 2s. 3¼d.; cured by "Byrne" process, dark to good, 1s. 9¼d. to 2s. 5½d. Sheets, fair to very fine smoked (Highland, 2s. 7½d. to 2s. 8¼d.), 2s. 4¼d. to 2s. 5¼d.; damp, mouldy, and part smoked, 2s. 0¼d. to 2s. 4d.; fair to fine unsmoked, 2s. 2½d. to 2s. 3d.; damp, mouldy, and stuck, 1s. 11d. to 2s. 2½d. Block, fine pale Lanadron, 2s. 3d. to 2s. 3½d. Scrap and Virgin, fair to good, 1s. 5½d. to 1s. 9d.; mixed and inferior, 1s. 1d. to 1s. 3¾d. Rambong, Crêpe, 2s.; scrap and block, nothing offered. Ceará, Crêpe and block, 1s. 9½d. to 1s. 9¾d.

Ceylon (180 tons).—Crêpe, thick dull to fine (one lot 2s. 4d.), 2s. 3d. to 2s. 3¾d.; fair to fine pale, dull to good palish, 2s. 3d. to 2s. 3½d.; light brown and grey, part streaky, 2s. 2½d. to 2s. 3¼d.; fair to good clean brown, 2s. 1d. to 2s. 2¾d.; dark and specky brown, 1s. 9d. to 2s. 1d.; dark and black, part pressed, 1s. 8¼d. to 1s. 11¼d.; dark to good smoked, 1s. 10½d. to 2s. 3d. Sheets, fair to good smoked, 2s. 4¼d. to 2s. 5d. Sheets and Biscuits, fair to good unsmoked (fine, 2s. 4d.), 2s. 2¾d. to 2s. 3¼d.; damp, mouldy, and stuck, 2s. 0½d. to 2s. 2½d. Scrap and Cuttings, fair to fine, 1s. 6d. to 1s. 10¾d.; mixed and inferior, 1s. 0¾d. to 1s. 4d.

Mangabeira.—Santos sheets, 1s. 3d. per lb.

Manicoba.—Sandy pats, 1s. 3d. per lb.

Manihot.—Thick Crêpe, 1s. 9½d.; pressed smoked scrap, 1s. 8d.; Lewa ball, 1s. 3½d.

Mozambique, &c.—Red sausage clean, 2s. 0½d.; ditto sandy, 1s. 8d.; reddish Ball, 1s. 8d. to 1s. 8½d.; unripe rooty Ball, 8d. to 9d.; Uganda slab soft, 1s. 4d. per lb.

Madagascar.—Gummy Ball and slab, 11½d. to 1s.

Congo.—Reddish Ball, part unripe, 1s. 8d. to 1s. 9d.

Tonkin.—Mixed reddish and white Ball and Ropes, 1s. to 1s. 3d.

Malaysian.—Brown and dark Crêpe, 1s. 8¾d. to 1s. 9¼d.

Pará statistics for the month of November (tons):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.
Receipts at Pará ...	2,130	420	= 2,550	agst. 3,760	3,540	3,790
Shipments to Europe	1,700	370	= 2,070	„ 2,510	2,310	2,400
„ „ America	940	100	= 1,040	„ 1,710	1,680	1,170

Crop statistics, June 30th, 1913, to November 30th, 1913 (five months):—

	Pará.	Caucho.	1913.	1912.	1911.	1910.	1909.
Pará { 1913 ..	10,700	2,190	12,890	14,140	12,180	13,140	13,200
Receipts { 1912 ...	12,220	1,920					
„ Shipts. Europe	5,420	1,350	6,700	7,980	6,850	6,890	6,240
„ „ America	5,030	980	6,010	8,100	6,790	5,510	5,900

The London Cocoa Market.

BY THE EDITOR.

ACCORDING to M. Edmond Leplae's report on the agricultural industries and resources of the Belgian Congo during the years 1911 and 1912, whilst the State-owned cacao plantations have dwindled from 150,000 trees down to some 104 hectares (about 250 acres), or say 75,000 trees, one or two privately owned estates have increased to a considerable extent, particularly those of the Société Anonyme Urselia in Mayumbe, of which our friend, M. Norbet Diderich, is the moving spirit and director, following on a short spell, too short in M. Leplae's eyes, as Director of Agriculture in the Congo. Of the lands owned by the Government, the Barumba Station, with its 75,000 trees, seems alone worthy of note to-day, and these produce 25,000 kilos of cacao (or an average yield of ⅓ kilo per tree), which sells in Antwerp at Fcs. 1.10 a kilo, and so brings in gross some £1,100. Meanwhile the output from the Mayumbe region has increased from 9 tons in 1900 to nearly 1,000 tons in 1910, and again last year. The original seed-cacao came from San Thomé. The Société Urselia seems to have two separate plantations in Mayumbe, say, 4,000 hectares at Benza-Masola, with 500,000 cacao trees, and 12,000 Hevea rubber, whilst the 2,000 hectares at Bangula carry some 317,000 cacao trees, making 817,000 in all. An average of ½ kilo per tree (against ⅓ kilo from the 75,000 trees up at the Barumba Station) would therefore give rather over 40 tons of cacao.

The London cocoa market does not at present promise to give those having cocoa to sell a joyful and happy Christmas so far as their business minds are concerned, for a more perplexing, bewildering, aggravating and generally "cussed" market* has not been encountered for a long time. There is no great plethora of cocoa as the statistics this month show. The Gold Coast may be doing well; we are glad to hear it, but, at any rate, although Liverpool, as usual, grumbles and says "nothing doing," it at least wound up the first week in December with a sale of 4,300 bags Accra kinds at 55s. to 58s., against 58s. to 61s. at this time in November. The Havre stock shows only 148,654 bags, against 161,435 bags at the end of October, whilst the London stocks, especially if you deduct the Guayaquils, are certainly not heavy. Why, therefore, we should have been inflicted with a state of absolute stagnation as has reigned in London for the past month is difficult to say. Meanwhile, what is, is, and that no one who is wise will worry about; what everyone is anxiously inquiring after is rather what will be, *i.e.*, will the market now break away altogether, or will shippers get squeezed over the end of the year and have to run prices up, or what? Last month I mentioned the difference of opinion that existed between buyers and sellers, or rather, would-be sellers, of Bahias, that difference still exists, and the sellers are still in the "would-be" state, for no matter how willing they have been to meet the market, the

* The descriptions, especially the last-named, are not, I beg to state, my own. I "picked them up," along with others not included here, down the Lane.

large manufacturers have stolidly refused to entertain any offer. This is probably due to the makers having filled themselves up direct from the producing centres, and so able and anxious to pull down values by bringing down the London published prices, and also to the fact that certain importers are (or were) anxious sellers of some substantial parcels lying at Southampton; the latter certainly has not helped matters, especially as it is uncertain as to how much of the cocoa, if any, has as yet been sold, and if sold, at what price. Meanwhile, the big planters in Bahia still say supplies are behind for the moment, and that there is no sign of a big output before January, and that buyers may yet get squeezed and have to pay dearer before prices finally drop. Of Guayaquil there is no news at all, except that the January-November receipts are very heavy and well ahead of last year, say, 748,300 quintals, against 680,800 last year, 738,900 in 1911, 677,400 quintals in 1910, and 593,200 in 1909.

The actual output of the Cameroons last year is now given as having been 4,551 tons (of 1,000 kilos), against the estimate in our May issue of 4,600 tons. Going to another African centre, that of San Thomé, we have received the following returns from Messrs. Martin, Weinstein and Co:—

	Bags.
Lisbon stock on October 31st	36,281
Add arrivals during November	81,416
	Makes 117,697
Deduct exports during November	51,494
Leaves stock on November 30th, 1913	66,203

The stock for last year was not given, probably because, as our readers may remember, during November, 1912, 70,000 bags were expected, but the steamer did not arrive until December, so that no landings except 10,743 Principé were put down for November last year, giving us a stock of 130,000 bags early in December last year.

Regarding the Gold Coast, has the greatly increased output of cocoa from there anything to do with the present Governor, Sir Hugh Clifford, who was, it will be remembered, in Trinidad and Ceylon before he went to the Coast? With such experience, coupled with his over-share of brains and energy, anything can be looked for from this, our coming West African possession, especially as Sir Hugh seems to be on the look-out for means to improve both the cocoa industry and the transport systems. Cocoa producers elsewhere, therefore, will do well to watch the Gold Coast with both eyes (we have already urged them to watch it with one eye), one on the cocoa, and one on the Governor, for with their combined efforts there is no saying what may be forthcoming. Ceylon is quite alive to this. "Among the first matters to which the new Governor devoted his attention," writes the *Times of Ceylon*, "was the cocoa industry, which is entirely in the hands of the natives, and is apparently languishing* through the want of proper transport facilities." From what we know of Mr. Tudhope, the Director of Agriculture, and especially of Mr. A. E.

Evans, the travelling instructor (with whom I took lunch the other day and "talked cocoa" hard the whole time), improved methods of cocoa cultivation will receive a great impetus with such a Governor, as the officials of the Agricultural Department certainly know their work, and believe in up-to-date methods. Mr. Frank Evans, who was Acting-Director in Trinidad, is also out that way now, so there are good men to "hustle" around and make the natives spray the trees, thin them out, and not, as at present, shift to another piece of planted-up land when the old estate gets too pest-ridden and is left to its fate and to spread trouble and pests around to other estates. As we all know, the Gold Coast is, comparatively speaking, a rich colony. "The solvency and prosperity of the Colony," says Sir Hugh, in his first message to the Legislative Council, "are matters which we must all regard with heartfelt satisfaction." With a surplus balance of funds, that quite troubles the Gold Coast Governor, and with the crying need for greatly extended and increased transport facilities *plus* Sir Hugh Clifford, it seems likely that the Gold Coast output of cocoa will continue to increase in the future, not because of the larger areas planted, but on account of the existing lands being able to convey their crops to the coast instead of leaving some 25 per cent. or more on the trees for lack of labour to pick it, as they are on the road acting as porters.

Havre, the same as London, wound up November with a dull market, and little inclination to trade either "spot" or forward. The deliveries nearly doubled the landings, and so reduced the stock to a considerable extent, as under:—

Havre Stock, November 30th—	1913. Bags.	Value. Fcs.	1912. Bags.	Value. Fcs.
Pará	7,782	82 to 86	15,129	83 to 85
Bahia	2,304	78 ,, 83	5,289	73 ,, 80
Venezuela	47,624	81 ,, 200	23,233	83 ,, 200
Trinidad	18,641	80 ,, 85	21,813	85 ,, 92
Grenada and O.W.I.	1,006	78 ,, 84	1,437	70 ,, 83
San Thomé	3,671	81 ,, 84	1,293	75 ,, 77
San Domingo	6,242	73 ,, 77	8,304	69 ,, 74
Haiti	2,370	70 ,, 79	8,783	63 ,, 75
Accra	30,673	75 ,, 78	28,108	68 ,, 73
Guayaquil... ..	15,723	77 ,, 86	22,294	76 ,, 82
Others	12,618	—	3,261	—
Totals	148,654 bags		138,944 bags	

London Stock, December 6th	1913. Bags.	1912. Bags.	1911. Bags.
Trinidads	10,660	5,189	4,816
Grenadas	2,966	2,659	5,851
Other W.I.	3,240	5,565	5,341
British Africa	4,564	4,280	6,735
Portuguese Africa	5,970	5,686	2,331
German Africa	2,573	8,122	4,690
Ceylon and Java	9,265	8,570	10,965
Guayaquil	19,940	24,065	41,845
Bahia and Brazil	2,127	3,997	226
Other Foreign	8,927	6,633	7,681
Totals	70,232	74,766	90,481

Coming to consumption, we have made a very poor show as regards deliveries for home consumption in the United Kingdom during November, being over 900 tons behind last year (2,148 against 3,061 tons for November, 1912, and 1,843 in 1911), and therefore, on account of this big falling away behind 1912 in our total for the eleven months, say:—

* Discouraged and kept back would be a more correct term.—
ED., T.L.

Raw Cocoa only—	Landed. Tons.	Del'd H.C. Tons.	Exported. Tons.	Stock (Nov. 30th) Tons.
Jan.-Nov., 1911—	29,367	22,392	6,275	10,011
" " 1912—	29,718	25,214	5,864	8,141
" " 1913—	31,576	25,154	6,304	9,131
Incr.	1,858	Decr. 60	Incr. 440	Incr. 990

The foreign manufactured also showed a big falling away. Whether, as some suggest, this general falling off is due to the mild, almost spring-like, weather we had during November (and which is still with us) having discouraged consumption, or that the financial tightness has curtailed consumption, or the high prices have discouraged the makers from buying and so taking up the cocoa, I cannot say; the sorrowful fact alone remains that the consumption is not going ahead as it should do. Here are the figures for the foreign makes:—

	Landed. November only.	Del'd H.C. November only.	Landed. January-November.	Del'd H.C. January-November.
1913 ...	975	944	12,512	11,028 tons
1912 ...	1,159	1,213	9,462	9,615 "
1911 ...	964	896	7,458	6,774 "

Public sales have been irregular, and when held they have been neither exciting nor reliable. There were no auctions either on December 2nd or 9th, and as we go to press early on account of Christmas, I cannot wait to see what the sale of December 16th will bring, but it should include some 1,400 bags or so of new-crop Grenadas which are certain to meet with a good demand—"at a price." Whether that price will be acceptable to the importers remains to be seen, but as after this date no sale can be held until January 6th, we shall, at the most, have had but this one set of auctions in six weeks, so maybe the importers will meet buyers' ideas and sell so as to clear up for further arrivals to come. Meanwhile, prices, as near as I can gauge, run as follows:—

Trinidad.—Good mid. red to fine marks are worth 68s. to 71s. or 72s., and about 620 bags good red sold (to the Government buyers) at 67s. to 68s.

Grenadas have been selling up to 67s. for new crop, but many buyers consider this level to be some 2s. too high. Good fair to good red sold at 65s. to 66s., and common unfermented to fair fermented 62s. to 63s. 6d.

Jamaicas.—Fair fermented last sold at 63s., and good red up to 66s.

St. Lucias are valued at 61s. to 66s. for ordinary to fine marks, but no sales have been reported lately.

Dominicas on the above basis should be worth up to 65s. for the best marks.

Java.—Fine bold last sold at 84s. to 85s.

Samoa.—Good bold realized 73s. 6d.

British African.—Accra kinds sell slowly up at Liverpool at 55s. to 58s., but buyers maintain that, with the large output, these prices should go lower.

Cameroons and San Thomé are both valued nominally up to 65s. for fine.

Bahias.—Makers have refused to give 65s. for fine superiors. Importers, on the other hand, claim that, compared with the last price paid for Grenadas, such a price as 65s. is too low.

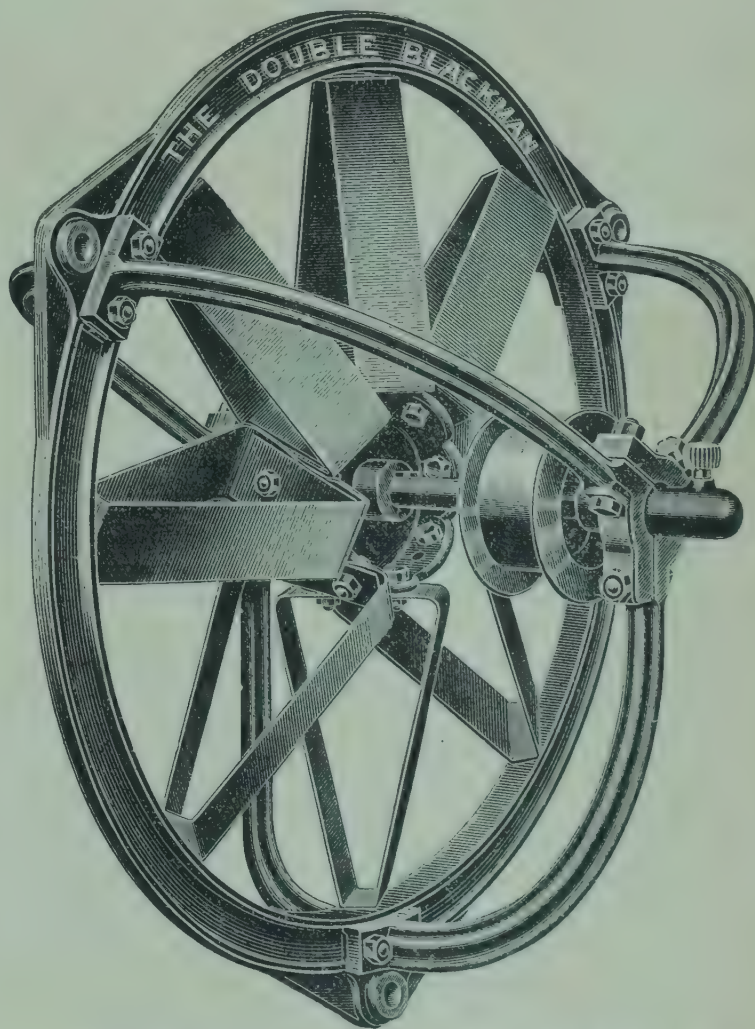
Guayaquils.—No sales reported. Ariba is valued at 68s. to 73s., and Caraquez up to 68s.

Ceylons.—Fine bold sold at 84s. and 85s. Of other kinds I have no news.

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